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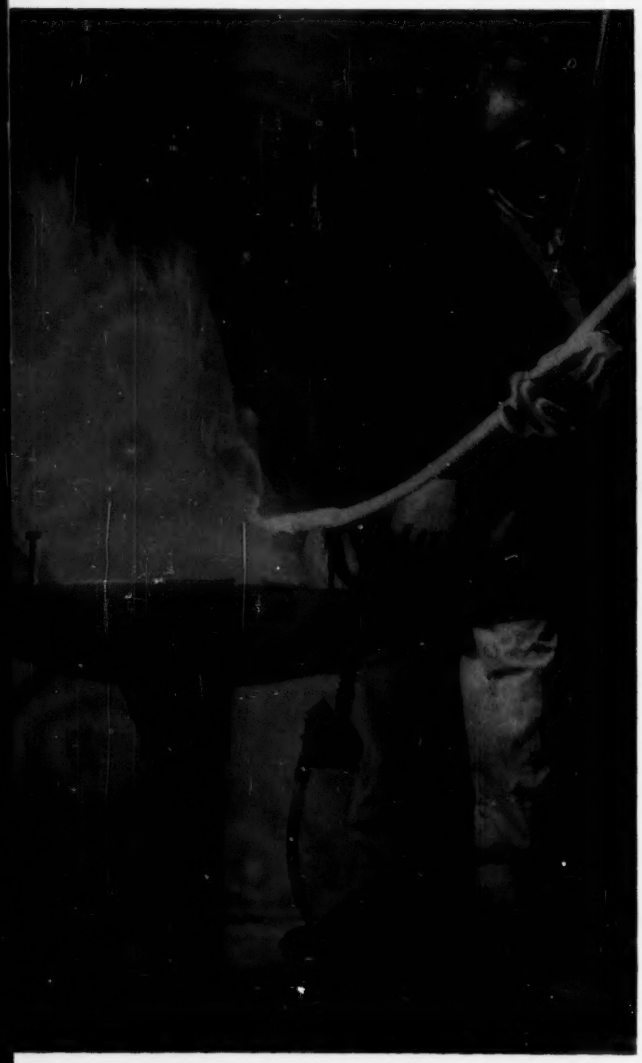
Chemical Week



Third-quarter returns are out—and the news is good. Sales, profits picking up fast . p. 20

Shake-up at Union Carbide: new name, new organization for plastics division . . p. 31

Their line? Taming blazes in Midwest Research's new fire lab for industry . . . . p. 57

Prison specialties plants—nationwide roundup of what, and how much, they sell . p. 67

Ethylene glycol output dips this year as exports slide from '57 peak . . . . . p. 77

November 1, 1958

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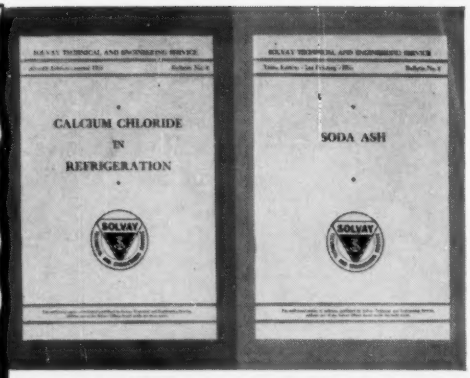

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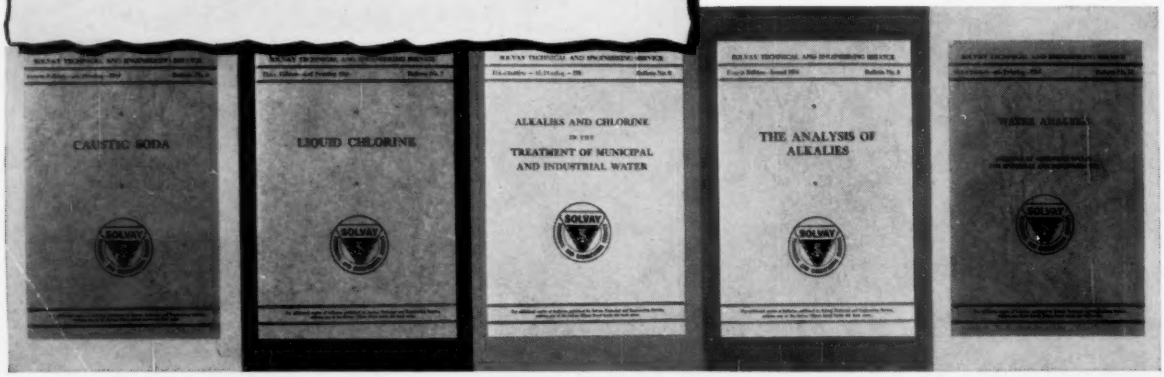

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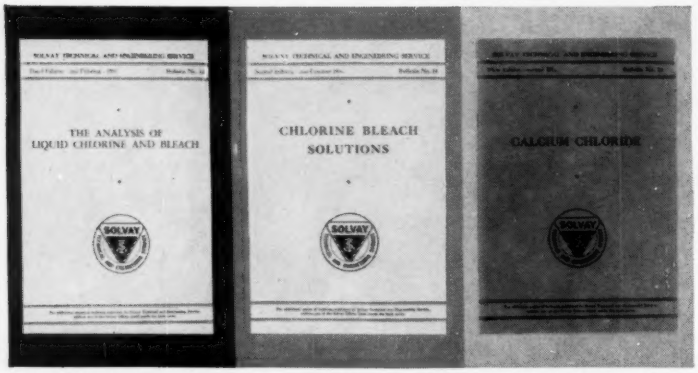

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Chemical Week

TOP OF THE WEEK **NOVEMBER 1, 1958**

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- **The wage spiral rises; and chemical wage hikes outstrip** average rise of all manufacturing industries ..... **p. 37**
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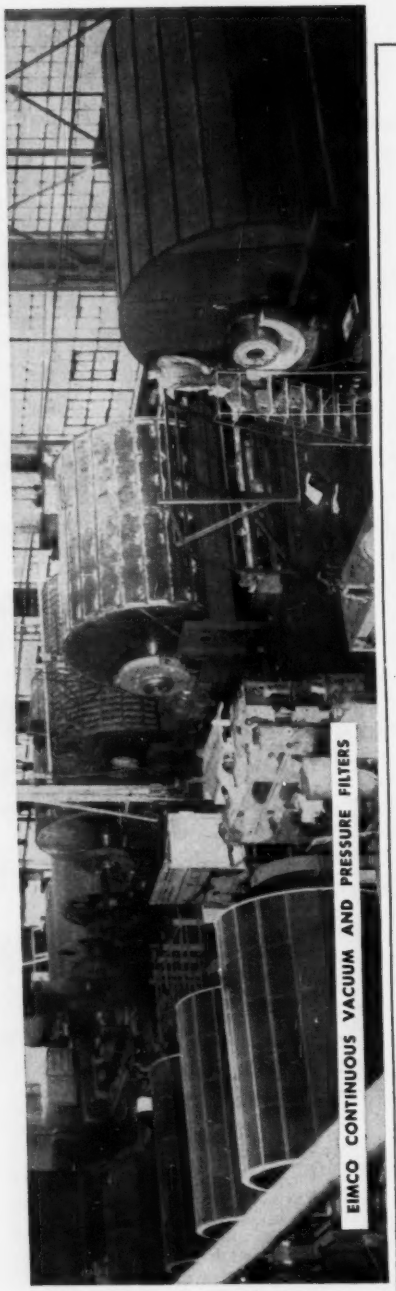

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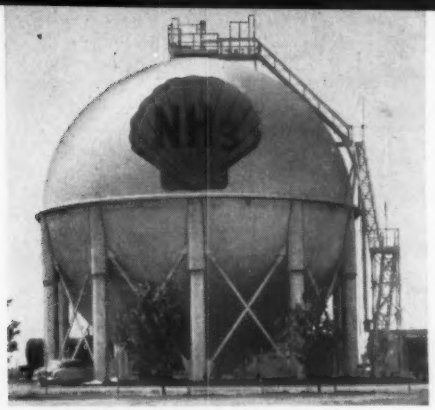
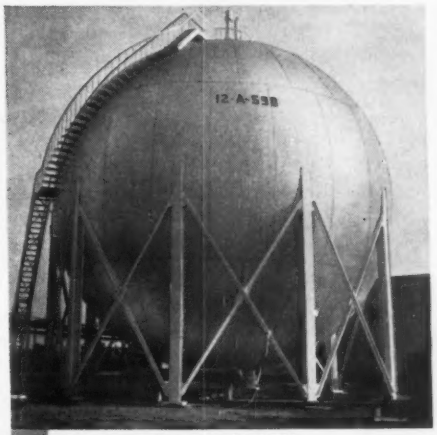
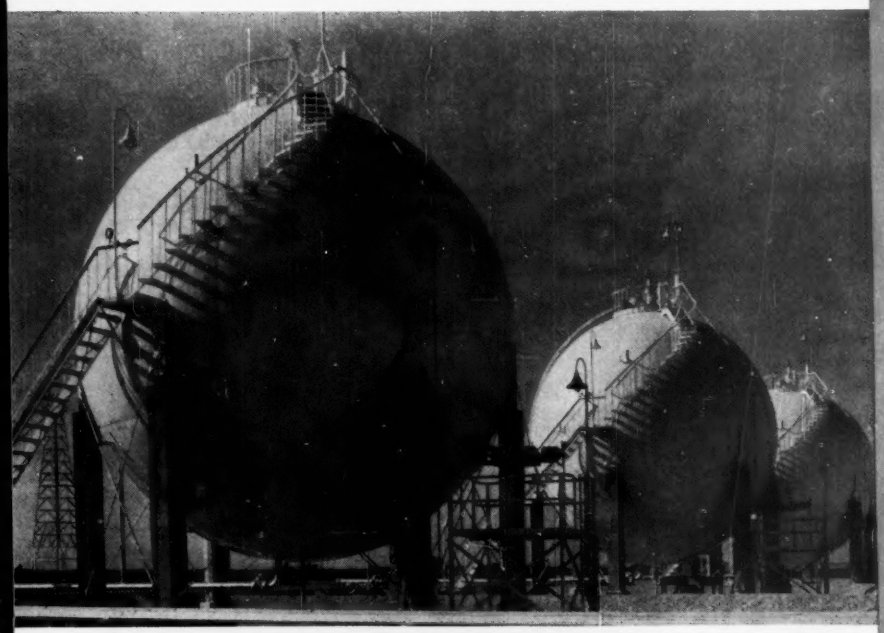


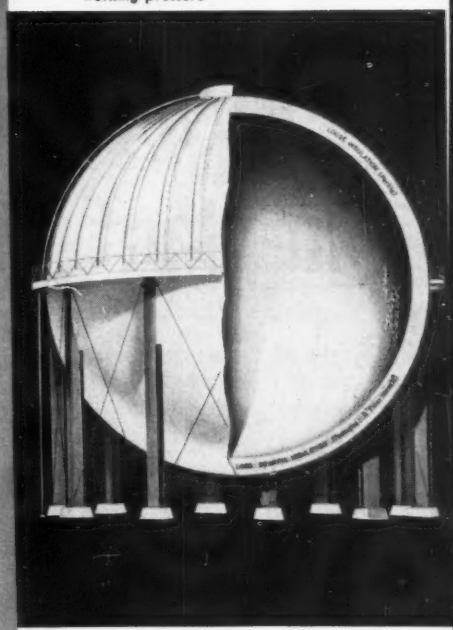
Ammonia. 64 ft dia, 55 lb working pressure



Isobutane. 50 ft 6 in. dia, 60 lb working pressure



Gasoline. Three 2500 bbl spheres, 30 ft dia, 20 lb working pressure



Liquefied chlorine. Cutaway view of insulated storage sphere

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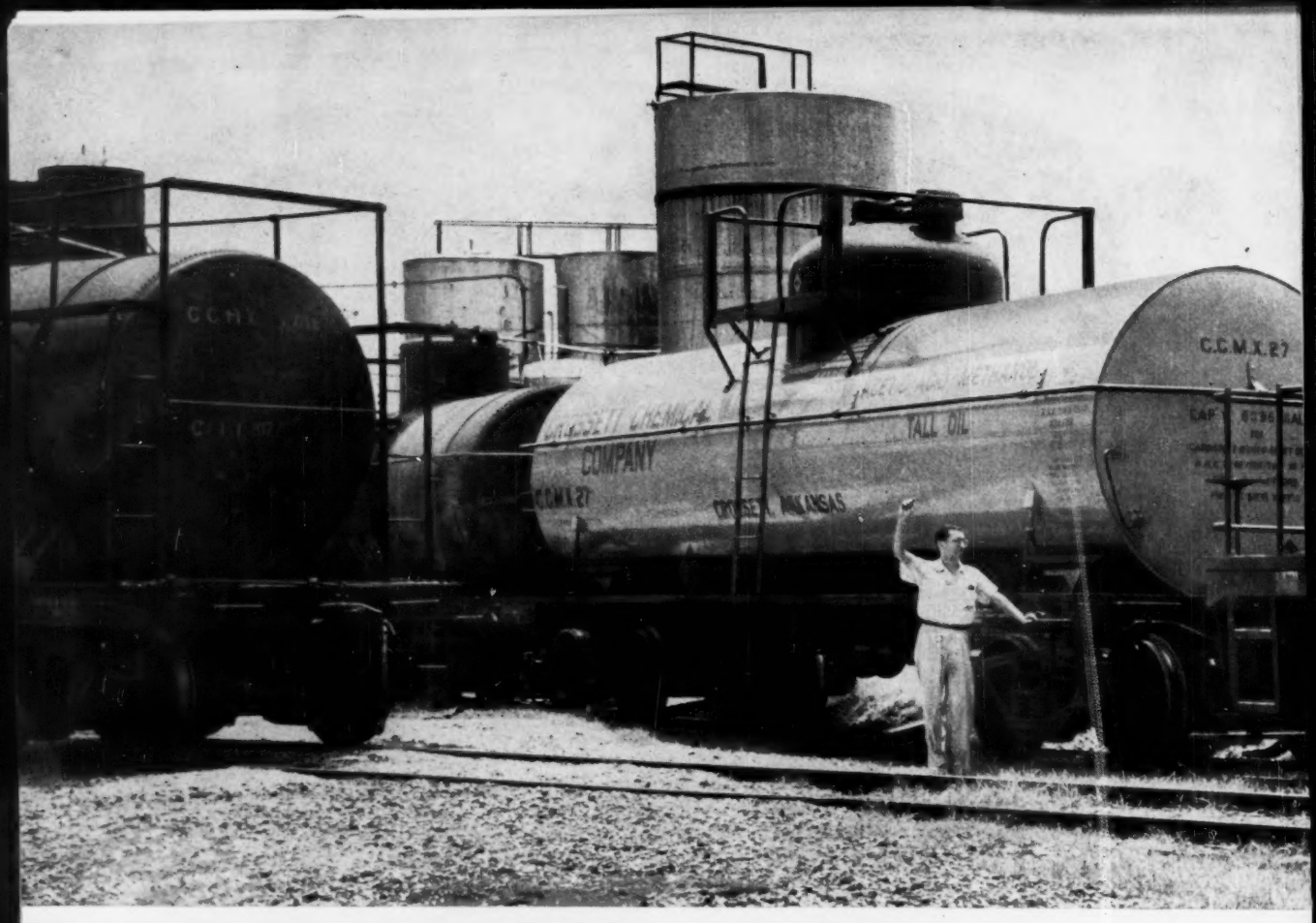

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OPERATING 7 DAYS A WEEK, 8 to 10 hours per day, G-E 45-ton locomotive at Crossett Chemical Co. hauls buggies to be filled with hardwoods from which charcoal, alcohol, acetic acid, and other chemicals will be produced.

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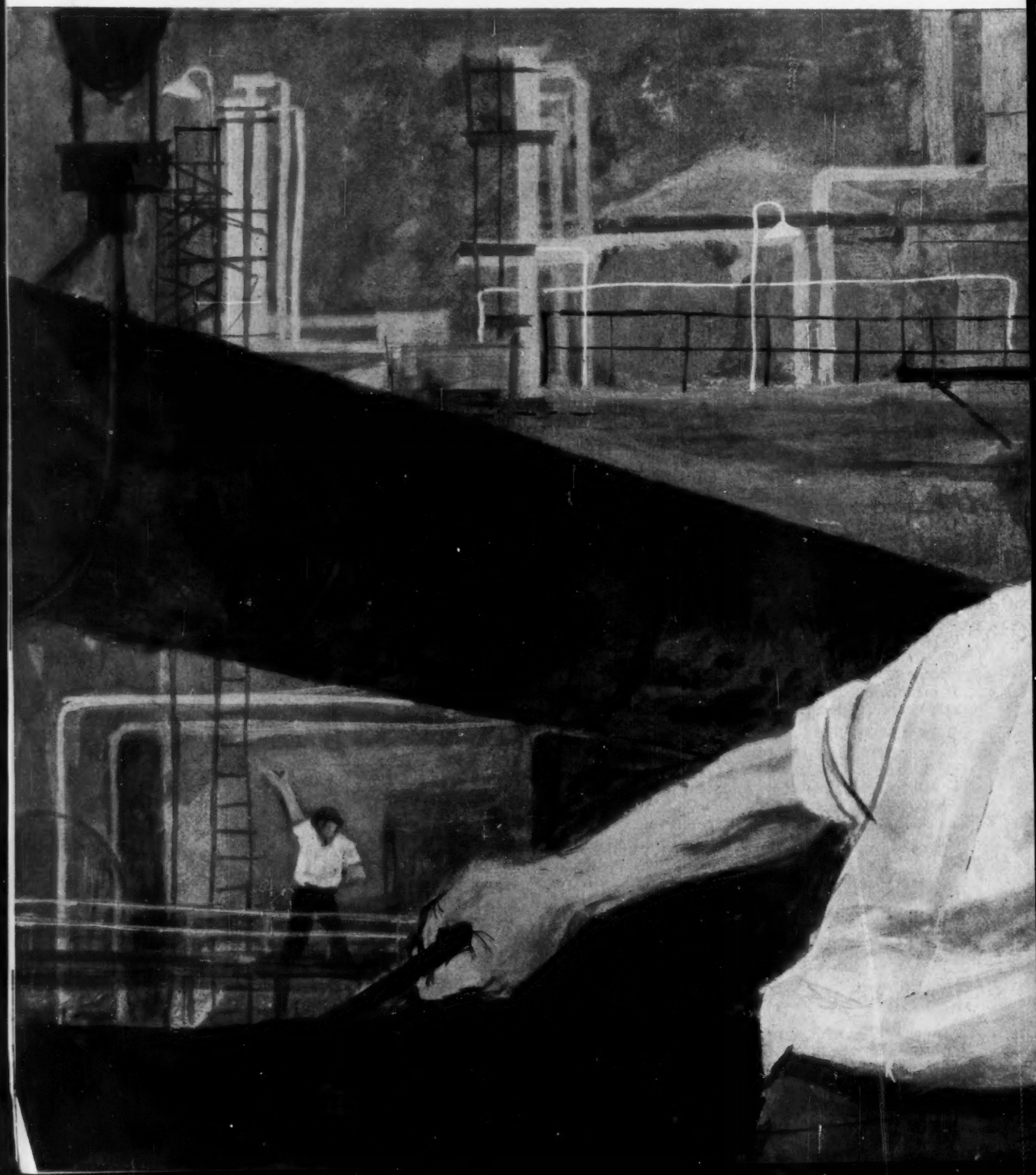

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OPINION

Remember Consultants

TO THE EDITOR: Your special report, "Plan '59: Modernization" (*CW, Oct. 11*), was well done. We, too, certainly feel there is no better time than now to examine facilities and processes with an eye to modernization and cost reduction.

Unfortunately, in Section 6 you neglected to mention one of the most important approaches to modernization—the industrial consultant. We feel that a consultant has a lot to offer a chemical company. Professional consultants with a wide background of experience can team up with a company's specialists in a joint effort that results in the most rapid translation of ideas to working processes.

All too often the dollar-saving ideas die a natural death because the production supervisor or plant engineer does not have the time to work out the details and put them into practice.

GORDON C. INSKEEP
Assistant to the President
Processes Research, Inc.
New York

'Bold Food Research'

TO THE EDITOR: Congratulations on your editorial stand on the importance of "bold food research" in solving present and future problems of feeding our rapidly expanding population.

[Bernard] Oser (*quoted in the CW Viewpoint, Oct. 18, p. 11*) has made a very significant point in warning of a hazard . . . We must be sure that our legislators also learn to recognize the danger of creating serious problems for future generations by overprotecting the present one.

MURRAY BERDICK
Coordinator of Research
Evans Research
and Development Corp.
New York

New Palletization Route?

TO THE EDITOR: I have read with a great deal of interest your article "New Boost for Automatic Warehousing" (*CW, Oct. 4, p. 55*).

Automatic palletizing is an operation that has been needed for years. Justification for a capital expenditure has always been present, in that labor has been required to place bags on pallets after filling.

The material-handling-equipment manufacturers arrived at an answer through solving the carton-handling problem. After the carton palletizer had proved its ability, it was modified to handle bags. The three makes available today that I know of run in price from $20,000 to $35,000, installed.

At this point, I cannot help but wonder if the wrong approach was used. We now have an expensive modified carton palletizer to palletize bags. Has any thought been given to designing a machine for bags alone that would be in the price range that could readily be justified?

. . . the problem won't be properly solved until we have a palletizer for bags that could be installed for $10,000, certainly less than $15,000.

WILLIAM T. CASKIE
Material-Handling Engineer
Operations Engineering Dept.
American Cyanamid Co.
New York

MEETINGS

Glass Container Manufacturers Institute, semiannual meeting, The Cloister Hotel, Sea Island, Ga., Nov. 10-13.

National Academy of Sciences, fall meeting, University of California, Berkeley campus, Nov. 6-8.

Atomic Industrial Forum, annual nuclear industry conference, Shoreham Hotel, Washington, D.C., Nov. 10-12.

Commercial Chemical Development Assn., joint meeting with **National Agricultural Chemicals Assn.,** Lord Baltimore Hotel, Baltimore, Md., Nov. 20-21.

Society of the Plastics Industry, eighth national conference and exposition, Morrison Hotel and International Amphitheatre, Chicago, Nov. 17-21.

National Conference on Air Pollution, sponsored by the U.S. Dept. of Health, Education & Welfare, Sheraton-Park Hotel, Washington, D.C., Nov. 18-20.

Manufacturing Chemists' Assn., semiannual meeting, Statler Hotel, N.Y., Nov. 25.

American Rocket Society, annual meeting, Statler Hotel, New York, Dec. 1-5.

American Institute of Chemical Engineers, annual meeting, Netherland Plaza Hotel, Cincinnati, Dec. 7-10.

American Nuclear Society, winter meeting, Sheraton-Cadillac Hotel, Detroit, Dec. 8-10.

Chemical Specialties Manufacturers Assn., annual meeting, Commodore Hotel, New York, Dec. 9-11.

BEHIND THE NEWS

RUDOLF FLESCH is probably the best known of today's experts on how to write well. His books—the trail-blazer was "The Art of Plain Talk"—are basic how-to texts on clear and understandable English.

In his "A New Way to Better English," published this week by Harper & Brothers, we are pleased to find three "well written" excerpts from CHEMICAL WEEK. The items, from our Technology Newsletter (*Jan. 4*), were written by Associate Editor Don Burke. They appear in Flesch's chapter on "How to Write Like a Pro."

Why are we quoted? To stress the need to be concise. "An enormous amount of time, money and effort could be saved," Flesch writes, "if the average business letter or report started with a brief summary." The quotes from CW (as well as from a second business publication) are used to support this statement.

Here's how Flesch summarizes his thinking on how to save wasted motion in writing:

1. Save every unnecessary comma and every unnecessary "that."

2. Don't spell out words that can be implied.

3. Use terse colloquial phrases to convey your ideas.

4. Use the most expressive verbs you can think of.

5. Let the names, numbers, specific data and verbatim quotes carry the story.

These are good rules for business writing. They are also a good summary of CW's writing objectives. Management men have too little reading time to be asked to wade through ponderous magazine articles trying to find out what the author really means to say.

Thank you for your kind words, Dr. Flesch. We'll continue to be word misers.

H. C. Johnson

Editor-in-Chief

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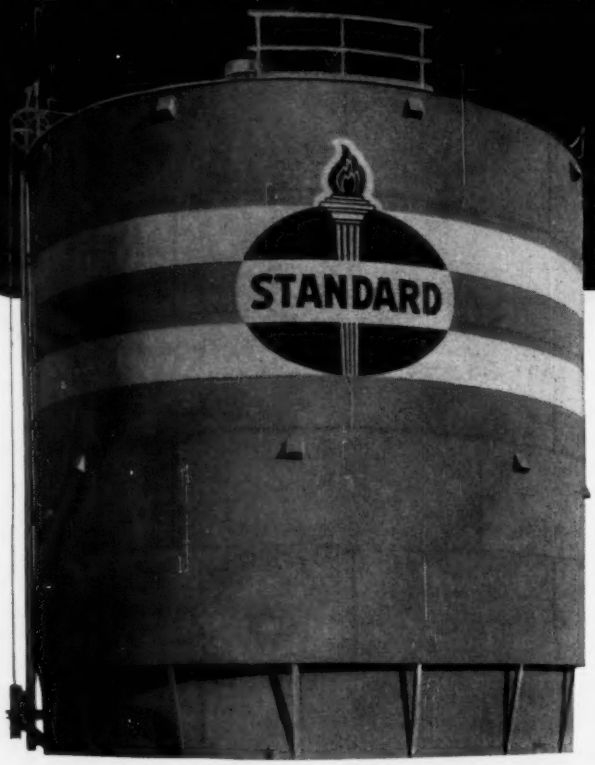

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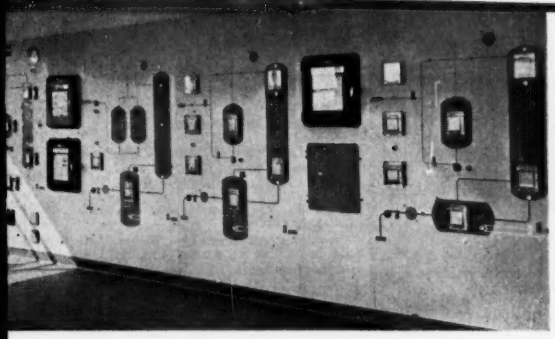

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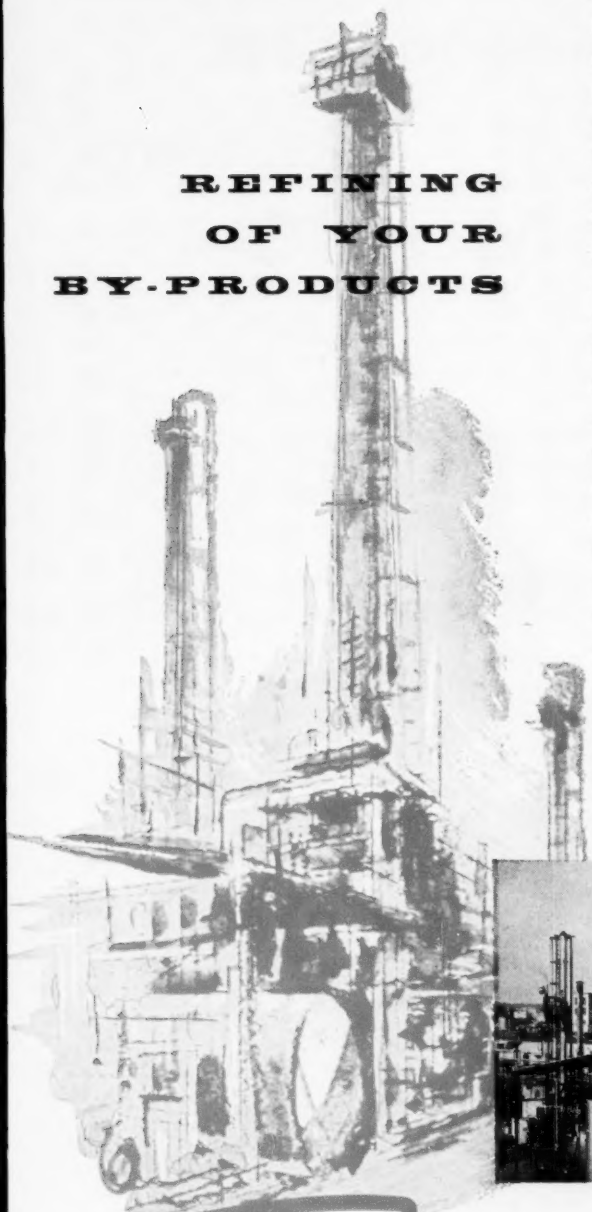

Partial List
of materials processed

- Acetone
- Amyl Acetate
- Amyl Alcohol
- Benzene
- n-Butyl Acetate
- n-Butyl Alcohol
- Butyl Cresols
- Butylene Glycol
- Capryl Alcohol
- Carbon Tetrachloride
- Chlorbenzene
- Chloroform
- Dibutyl Phenol
- Dibutyl Phthalate
- Dicapryl Phthalate
- o-Dichlorbenzene
- Diethanolamine
- Diethylene Glycol
- Dimethyl Phthalate
- Dimethyl Sebacate
- Dipropylene Glycol
- Dodecyl Alcohol
- Dodecylbenzene
- Ethyl Acetate
- Ethylene Dichloride
- Ethylene Glycol
- Ethyl Hexanediol
- Ethyl Lactate
- Glycerine
- Glycol Ethers
- Hexyl Alcohol
- Isobutyl Alcohol
- Isodecyl Alcohol
- Isooctyl Alcohol
- Isophorone
- Isopropyl Acetate
- Isopropyl Alcohol
- Methyl Alcohol
- Methyl Amyl Alcohol
- Methylene Chloride
- Methyl Ethyl Ketone
- Methyl Hexyl Ketone
- Methyl Isobutyl Ketone
- Monoethanolamine
- Naphthas
- Nitrotoluols
- Nonyl Phenol
- Octyl Acetate
- Perchlorethylene
- n-Propyl Alcohol
- Propylene Glycol
- Pyridine
- Toluene
- Trichlorbenzene
- Trichlorethylene
- Tricresyl Phosphate
- Triethyl Amine
- Triethylene Glycol
- Trimethyl Borate
- Vinyl Acetate
- Xylene

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bulk c.l. works 100 lbs 1.60 —
Light, 58% paper bgs., c.l. works 100 lbs 1.85 —
paper bgs. l.c.l. stock pts. 100 lbs 3.95 4.72
bulk c.l. works 100 lbs 1.55 —
Soda caustic flake 76% dms c.l. works, frt. equald 100 lbs. 5.20 - —
Liq. 50% sellers tanks works dry basis 100 lbs 2.90 -
50% [illegible] type, sellers tanks works, dry basis 100 lbs 2.80 3.00
73%, sellers' tanks, works, dry basis 100 lbs. 3.60 —
Soda, caustic, liq., 73%, rayon type, sellers' tanks, works, dry basis 100 lbs 2.90 - 3.10
works, 100 lbs. 4.80 - —
Soda sal conc. bgs. c.l. works 100 lbs 2.50 —
bgs. smaller lots works 100 lbs 2.80 —
Sodium acetate anhyd. bgs., c.l., dlvd E lb. 14½ —
bgs., l.c.l. same basis lb. 16½ —
NF, 60% gran. dms. c.l., works lb 15½ —
dms., l.c.l., works lb 17½ —
Sodium alginate, NF white powd. dms. 300 lbs or more lb 93 —
Sodium p-aminosalicylate, dms. 100-lb lots or more, frt adjusted lb 2.76 —
Sodium antimoniate, bgs., c.l., dlvd. E lb. .25½ - —
bgs., l.c.l., dlvd. E lb. .27 —
Sodium arsenate, 60% arsenic pentoxide, dealers, dms., ton or more, works lb. .26 —
dms., less than ton lots, works lb. .26½ - —
Sodium arsenite 90% pink powder 75% arsenious oxide, dealers, dms., ton lots or more, works. lb. .17½ - —
dms., less than ton lots, works. lb. .18 - .19
Sodium ascorbate, dms. 25-50 kilo lots kilo. 10.00 —
dms., 10-kilo lots kilo 10.35 —
dms., 5-kilo lots kilo 10.75 —
dms., 1-kilo lots kilo 11.00 —
bots. 500-gram bots kilo. 11.50 —
Sodium benzoate, tech. c.l. t.l., frt. alld lb. .35 - —
dms., l.c.l. same basis lb .39 —
USP, c.l., t.l. frt. alld lb .38 - —
ton lots same basis lb. .43 - —
1,000-lb lots, same basis lb .45 - —
Sodium bicarbonate USP gran., bgs c.l., works 100 lbs 2.95 —
bgs. l.c.l. works 100 lbs 3.85 —
USP, powd., bgs. c.l. works 100 lbs 2.55 —
bgs. l.c.l. works 100 lbs 3.45 —
Sodium bichromate gran., bgs. c.l., t.l. works lb 13 —
bgs. l.c.l. works lb 13½ 14¾
Sodium bifluoride bbls c.l works frt equald lb 19½ —
bbls. l.c.l. same basis lb 1990 —
Sodium bisulfate bulk c.l works 100 lbs 2.00 —
dms. c.l., frt equald 100 lbs 3.00 3.60
dms. l.c.l. frt equald 100 lbs 3.50 4.10
Sodium bisulfite anhyd. bgs., c.l. works 100 lbs 5.00 -
bgs., l.c.l., works 100 lbs. 5.45 - —
Soln., 35° bbls., c.l., works 100 lbs. 1.70 - —
bbls. l.c.l. works 100 lbs 2.20 —
Sodium borate (see Borax)
Sodium bromide, USP gran., dms., works lb. .40 —
Sodium carbonate, cryst. monohydrated (see Soda sal)
Sodium carbonate monohydrated, bgs. c.l. works 100 lbs 3.10 —
bgs. l.c.l. works 100 lbs 3.50 —
Sodium carboxymethyl cellulose (see CMC)
Sodium chlorate cryst., 350-lb. dms., c.l. works lb. .09 —
dms. l.c.l. works lb .09½ 10½
Sodium chlorate in 100-lb. dms. only, ¼c per lb higher
Sodium chloride tech (see Salt)
Sodium chloride USP gran. bgs lb .05 —
Sodium chlorite tech. dms. c.l. works lb. .58 - —
dms., 20-dm. lots or more, works. lb .66 -
dms smaller lots works lb .70 .73
Sodium chloroacetate tech. dms. c.l. works lb .27 —
dms. l.c.l. works lb .28 —
Sodium chromate anhyd. fib dms. c.l. t.l. works lb 14¾ —
fib. dms. l.c.l. works lb 15¼ 16½

Sodium chromate, tetrahydrate, bgs., c.l., t.l., works lb. .1015- —
lb .1065 1190
bgs. l.c.l.
Sodium citrate anhyd. dms lb .62 —
NF VIII, gran. dms lb 26½ 27½
USP XIV, gran dms lb 29½ 30½
Sodium citrate USP powd prices ½c higher
Sodium cyanate dms. 1,000-lb lots, works lb .85 —
dms. smaller lots works lb .90 1.10
Sodium cyanide, flake, 96-98% dms. c.l or 20,000-lb lots lb .193 —
dms. over 1,000-lb lots lb .203 —
dms 100-lb to 1,000-lb lots lb .213 —
Gran sodium cyanide 1c higher
Sodium diacetate, 33-35% acidity 250 lb dms works lb .15 —
250-lb dms l.c.l works lb 15¾ —
Anhyd. dms c.l. works lb .18 —
dms. l.c.l works lb 18¾ —
Sodium dimethyl dithiocarbamate, 40% soln., dms., c.l., t.l., frt. alld., 100% basis lb. .42 - —
dms., l.c.l., l.t.l., same basis lb. .47 - .52
tanks, same basis lb. .38 - —
Sodium ferrocyanide bgs. 10-ton lots lb 13½ —
bgs. smaller lots lb .14 —
Sodium fluoride white, 97% fib dms. c.l. works, frt. equald lb .1390 —
fib dms. l.c.l. works, frt. equald lb .1430 —
Sodium formate bgs. c.l. works 100 lbs 7.00 —
bgs. l.c.l. works 100 lbs 8.65 —
Sodium gentisate 100-lb fib dms. lb 5.50 —
Sodium gluconate refd. dms lb .84 —
Tech., dms., bgs. lb. .37 - .39
Sodium hydride powd. dms. works lb 1.90 2.75
Sodium hydrosulfide (see Sodium sulfhydrate)
Sodium hydrosulfite dms. c.l. frt alld lb .2[illegible]
dms., l.c.l. frt alld lb
Sodium hydroxide NF pellets 100-lb dms. 1 to 100-dm lots [illegible]b
Sodium hydroxide tech (see Soda, caustic)
Sodium hypophosphite NF dms. 1,000-lb. lots lb.
Sodium hyposulfite anhyd. photo grade bgs. c.l. works 100 lb
bgs., l.c.l., works 100 lb
Tech., bgs. c.l., works 100 lbs
bgs., l.c.l., works 100 lbs
Sodium hyposulfite hexahydrate pea. cryst. bgs. c.l. works 100 lb
bgs. c.l. works 100 lb
photo grade bgs. c.l. [illegible]
bgs. l.c.l. [illegible]
Sodium hyposulfite, tech., [illegible]
bgs., l.c.l.
Sodium iodide, [illegible]
Sodium lactate [illegible]
Sodium lauryl [illegible]
dms., l.c.l., [illegible]
tanks dlvd [illegible]
Sodium metahisulfite [illegible]
Sodium metasilicate anhyd. [illegible]
bgs., 6,000-19,900 lb lots [illegible]
dms. c.l. works
dms., l.c.l. works
Sodium metasilicate penta [illegible]
bgs. c.l. works
bgs. l.c.l. works
dms. c.l., works
dms. l.c.l works
Sodium molybdate anhyd. works t.t [illegible]
Cryst dms works frt [illegible]
Sodium monoglutamate (see dium glutamate)
Sodium monohydrate (see carbonate monohydrate

Sodium naphthionate, bbls .. lb .70 - —
Sodium nitrate dom., crude, bgs., c.l. works ton. 48.75 - —
bulk, c.l., works ton. 45.25 - —
Sodium nitrate, imp., 100-lb. bags., c.l., Atl., Gulf, Pac., whse. ton. 49.75 - —
bulk, c.l., same basis ton. 46.25 - —
Sodium nitrite USP, bbls., c.l., works frt equald 100 lbs. 9.00 - —
bbls. l.c.l. same basis 100 lbs. 11.00 - —
Sodium orthosilicate conc. dms., c.l., works 100 lbs 6.70 —
dms. l.c.l., works 100 lbs 7.05 7.65
Sodium orthosilicate hydrated, flake, bbls., c.l. works 100 lbs 5.65 —
bbls. l.c.l. works 100 lbs 7.60 7.90
Sodium oxalate 98% bgs. works 100 lbs. 12.35 -
Sodium para aminobenzoate (see Sodium p-aminobenzoate)
Sodium para aminosalicylate (see Sodium p-aminosalicylate)
Sodium pentachlorophenate, briquets, bgs. c.l. works, frt. equald lb .26 —
bgs. l.c.l. same basis lb 27½ 34
Pellets bgs. c.l., same basis lb 26 —
bgs. l.c.l. same basis lb 27½ 34
Sodium pentachlorophenate, powd., bgs., dms., c.l., same basis lb. .25 - —
bgs dms l.c.l same basis lb 26½ 33
Sodium pentachlorophenate, 20,000 lbs., min truckloads ¼c per lb over carlot prices
Sodium pentobarbital, USP, dms., 100 lbs. or more lb. 6.00 - —
Sodium perborate NF, tech., bgs., c.l. works lb 19 —
bgs. l.c.l. works lb 21 —
Sodium peroxide dms c.l. t.l. dlvd E of Miss lb 20½ —
dms l.c.l same basis lb 21 21¹
Sodium phenobarbital, USP, 100-lb. dms lb. 3.75 - —
Sodium phenolsulfonate, USP IX, gran., dms lb. .50 - .51
NF, powd., dms. lb. .53 - .54
Sodium phosphate, dibasic anhyd., bgs., c.l. frt equald 100 lbs 7.95 —
[illegible], l.c.l., same basis 100 lbs. 8.35 - 9.40
duohydrate bgs., c.l., frt. equald 100 lbs 4.60 —
, l.c.l., same basis 100 lbs. 8.10 - —
phosphate, dibasic, USP, dried, powd., bgs., dms., works lb. .19 - .20¹
phosphate, monobasic, an-, bgs., c.l., frt. equald. 100 lbs. 9.00 - —
s., l.c.l., same basis 100 lbs. 9.40 -10.00
phosphate, tribasic, an-, bgs., c.l., frt. equald. 100 lbs. 9.05 - —
bgs. l.c.l. frt equald. 100 lbs 9.45 10.05
ryst., bgs., c.l., t.l., frt. equald. 100 lbs. 4.60 - —
bgs., l.c.l., frt. equald 100 lbs. 5.00 - 5.75
[illegible]hate in dms. 60c to [illegible]bgs
[illegible]see Sodi-
[illegible]d. bgs., equald. 100 lbs 11.10 —
100 lbs. 11.85 -12.35
, dms., ks lb. .36 -
lb 37 .39
basic, orks, 0 lbs. 7.81 —
0 lbs. 9.21 - 9.71
,000- lb. .78½ - —
s. lb. .81½ - —
c.l., hs 2.35 —
hs 4.10 4.35
os. 4.35 - 4.60
s 4.75 4.90
s 5.35 5.60
E. of Miss., and Va., Ala., ex E of 100°; and Vt. in zones, Daven- k E of 98° nn Mo (ex- N C., S C., E. of 100° (ex- La and Miss Kan Neb W W of 100° ing El Paso; Nev., N M.,
, bgs., 100 lbs. 5.70 - —
100 lbs. 6.20 - —
100 lbs. 5.00 - —
works. 100 lbs 5.35 —
100 lbs. 5.50 - —
works. 100 lbs. 5.85 - —

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Metallurgical company—Called in to help settle a debate between plant engineers and safety department about where to put a large NH_3 tank, Herb Kerr's experience helped influence final decision. Later Kerr put in a 16-hour day helping to unload first tank car and get equipment running properly.

Big chemical company—Problem: to recover NH_3 used as a solvent. Although customer preferred not to reveal full details of process, Kerr and George Cleek, Allied specialists, were able to devise for them an economical method for purification and recovery.

New manufacturer—Wanted to make household ammonia. Needed help to get started. Kerr conferred with Gar Ellis on laboratory test before suggesting equipment and recommending a supplier of an additive which was known to give the right degree of cloudiness.

Chemical specialty company—Small, new at using NH_3. Bought some war surplus tanks, ran into problems, called Allied. "Zeke" Sziklas responded. Checked equipment they had, recommended additions, lined up contractor to install.

Paper mill—was considering ammonium bisulfite pulping. Allied worked out complete plans for NH_3 equipment required. Herb Kerr checked with "Westy" Westlake of engineering research before proceeding on trip to be on hand at startup—and for another three days—to make sure operations would continue smoothly.

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Business
Newsletter

CHEMICAL WEEK
November 1, 1958

Paper producers will need all the capacity they can muster to meet the demands of a swelling population and new product uses. That was the theme of talks by two industry spokesmen late last week.

Despite its present 300,000 tons/year of unused capacity, St. Regis plans to spend $150 million over the next seven or eight years building 500,000 tons of additional capacity, President William Adams told San Francisco securities analysts. This does not include expansions in its Canadian subsidiary. Sales by '65 will reach about $625 million, he predicted.

For the industry, sales and capacity chart lines may meet in '65. H. T. Mead, Mead Corp. financial vice president, told the Philadelphia securities analysts. Industry capacity, both men pointed out, is 36.1 million tons now, will hit 37.2 million tons in '60. But per-capita consumption during the '57-'60 period is expected to rise from 400 lbs./year to 500 lbs./year. Between '57 and '65, consumption will probably rise 42%, totaling 43.8 million tons.

Both companies report the sales and profit upturn is under way. St. Regis' August-September earnings were running at an annual rate of about $3/share, and will likely hit $2.25/share for the year. Earnings in '57 were $2.53/share on sales of $361 million. Mead expects its '58 sales to be $245-255 million. Last year's premerger total: $208 million. Nine-month sales total $192.9 million; profits, $7.8 million.

The slump taught paper producers some lessons, Adams told the analysts. Full-capacity operation in the postwar years blinded producers to the principle of basing prices on operating rates of 80-90%. Mounting overcapacity and its accompanying costs forced prices up during the past two years for every important grade of paper except container board. And the producers had to find new ways to cut costs. Moreover, for the first time in a decade, production time was available for experimentation, which broadened prospects for new uses for paper and paper products.

St. Regis and Mead each have mergers in the works. St. Regis will extend its operations in the paper converting and container fields by joining with F. J. Kress Box Co. (Pittsburgh), producer of corrugated and fiber shipping containers, whose '58 sales are expected to hit $20 million. Mead is acquiring Wrenn Paper Co. (*p. 24*).

•

Older materials giving way, newer materials taking over—the age-old theme is clear in this week's moves:

• Continuing drop in consumption of 100% pure wool fabrics is reflected in the closing of Forstmann Woolen Co. operations at Passaic, N.J., leaving only one woolen company in business in that area.

• American Viscose (Philadelphia) is planning to halt production of rayon textile yarn at Roanoke, Va., and to sell the entire facility.

• Despite current overcapacity in the polyethylene industry, Dow has just completed a program to double its original polyethylene capacity at Freeport, Tex., and expects to "complete still another expansion of major proportions" next July. Dow also has expanded its compounding facilities (anticipating the introduction in '59 of wire and cable formulations); and the company is going ahead with its linear polyethylene plant at Bay City, Mich.

• Overseas, British Celanese and Italy's Montecatini are disclosing big new petrochemical expansions that will add up to more plastics and synthetic fibers. British Celanese will increase capacity of its oil-cracking plant at Spondon by 40%, permitting greater output of ethylene, propylene, and their derivatives. Montecatini is negotiating a 20-year debenture loan of 30 billion lire ($48 million) for expansion in chemicals, plastics and fibers—particularly in polypropylene fiber.

•

Late sales-and-earnings statements sketch more detail into a generally bullish CPI business picture this week *(p. 20)*.

Freeport Sulphur posted third-quarter earnings of $3.1 million, about the same as last year's July-to-September period, but 4% higher than in the preceding three months.

Victor Chemical boosted its third-quarter net to $906,405, compared with $748,442 in the same quarter last year. Earnings for the nine-month period were off 6%.

Metal & Thermit Corp. reports its best quarter so far this year —sales of $8.9 million and earnings of $458,445. But, while both represent new quarterly marks for '58, they were lower than corresponding figures in '57.

•

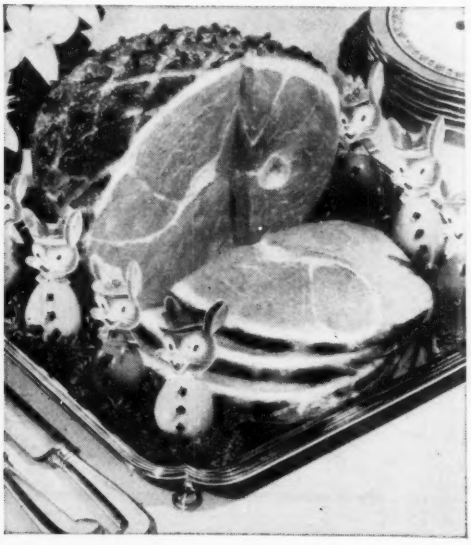
The Pentagon is stepping up development of solid propellents for rockets and missiles *(CW, Sept. 13, p. 32)*.

This week, The Defense Dept.'s Advanced Research Projects Agency awarded solid-fuel research contracts—totaling about $5 million—to four CPI companies that have no previous record of work on solid propellents: American Cyanamid, Dow Chemical, Esso Research and Engineering, and Minnesota Mining & Mfg. Objective: "completely new" solid propellents.

The agency invited 48 companies to bid on these projects. The new contracts are for one year, probably renewable.

HOW *HERCULES* HELPS...

SET NEW STYLES IN PLASTICS—Diadem's new "Hairtainer," a multispring comb adaptable to any hair style, dramatizes the unique combination of resilience and rigidity offered by Pro-fax®, Hercules polypropylene, lightest of all plastics. Pro-fax is setting new standards for plastics where lightweight, exceptional heat resistance, chemical inertness, toughness and styling are essential.



ENHANCE COUNTRY-CURED FLAVOR IN HAMS—HVP®, Hercules hydrolyzed vegetable protein, is helping ham packers capture the elusive old-fashioned, slow-cured flavor in modern hams. Manufactured from nutritious wheat, HVP in liquid form can be easily added to regularly prepared cures to add a pleasant and distinctive flavor.

WORK WONDERS IN KITCHENS—The appearance of fine wooden kitchen cabinets is greatly enhanced by finishing them with nitrocellulose lacquer. Another reason why Henry M. Carr, Inc., Frankfort, Ind., applies a lacquer finish to birch cabinets such as these is to gain rapid air-dry. No baking equipment is needed to provide a tough, durable finish.

HERCULES POWDER COMPANY
INCORPORATED
900 Market Street, Wilmington 99, Delaware

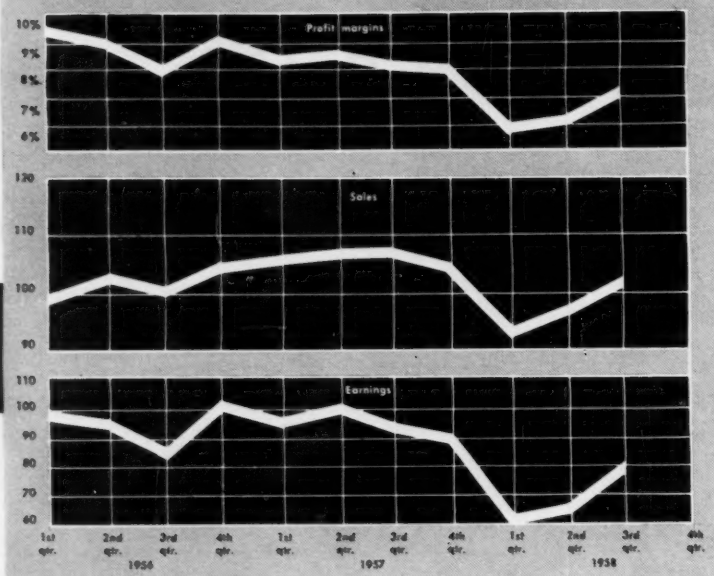
G58-8

CHEMICAL MATERIALS FOR INDUSTRY

HERCULES

Snapback in Ec

CW Index of Sales and Earnings



Based on quarterly sales and earnings totals for 13 leading chemical companies: Allied Chemical, American Cyanamid, Diamond Alkali, Dow Chemical, Du Pont, Hercules Powder, Hooker Chemical, Interchemical Corp., Koppers, Monsanto, Rohm & Haas, Stauffer Chemical, Union Carbide.

	Sales 1st 9 mos '58 ($ million)	Change 1st 9 '5 (perc
Air Reduction	$ 128.	down
Allied Chemical	473.	down
American Cyanamid	388.	down
American Potash	35.	up
Atlas Powder	48.	down
Diamond Alkali	84.	down
Dow Chemical[2]	456.	down
Du Pont[3];[6]	1,323.	down
Eastman Kodak	551.	up
Hercules Powder	177.	down
Hooker[5]	91.	down
Interchemical	81.	down
Koppers	197.	down
Lilly, Eli[3]	131.	down
Monsanto[4]	403.	down
National Distillers	373.	down
National Starch	33.	up
Nopco Chemical	21.	up
Pan American Sulphur	N.R	—
Parke, Davis	125.	up
Pfizer[3]	160.	up
Rayonier	78.	down
Reichhold	54.	up
Rohm & Haas	127.	down
Smith Kline & French	92.	up
Stauffer	122.	up
Union Carbide	929.	down
Wyandotte	58.	down

CHEMICAL companies' third-quarter statements—out this week—show profits and sales rapidly gaining momentum in a rebound from recession lows. Most encouraging are some near-spectacular profit gains, evidence that cost-cutting programs are starting to pay off in wider profit margins.

Mirroring the rebound is the *CW* earnings index (*chart, above*), which spurted to 80.5, compared with 68.8 for the second quarter—the biggest quarterly gain in three years. And while sales also continued a steady climb, profit margins widened at a faster clip, hitting 8.3%.

Optimism Growing: Improved margins—an indication that the profit squeeze may be letting up, together with bullish business reports in the current quarter, form the basis for snowballing optimism among chemical men.

"Significant," says Diamond Alkali's president and chairman, Raymond Evans, is Diamond's third-quarter earnings boost of 9% while sales were off 8%.

"This reversal of the usual relationship between fluctuating sales and earnings resulted chiefly from our intensified cost reduction and profit improvement efforts, which should prove even more effective as volume increases."

Interchemical President Herbert Woodman, estimating a nine-month earnings hike to $3.37/share, compared with $3.11 last year, credits the increase to cost-cutting measures, modernized facilities and a paid-off expansion program.

Packaging Will Grow: Woodman also predicts further acquisitions and expansion, expects the company's greatest growth

Earnings Sets Optimism Snowballing

Change from 1st 9 mos. '57 (percent)	Net 1st 9 mos. '58 ($ million)	Change from 1st 9 mos. '57 (percent)	Sales 3rd qtr. '58 ($ million)	Change from 2nd qtr. '58 (percent)	Net 3rd qtr. '58 ($ million)	Change from 2nd qtr. '58 (percent)	Ratio, net to sales, 3rd qtr. '58 (percent)	Ratio, net to sales, 2nd qtr. '58 (percent)
down 8.6%	$ 9.8	down 21.3%	$ 43.2	up 1.9%	$ 3.2	up 0.4%	7.4%	7.5%
down 9.1%	23.0[1]	down 30.0%	158.5	down 4.8%	8.1	up 0.2%	5.1%	4.8%
down 1.0%	27.9	down 22.8%	130.9	up 4.9%	8.7	up 26.9%	6.6%	5.5%
up 9.1%	3.2	down 11.3%	12.0	down 1.6%	1.0	down 14.9%	8.0%	9.2%
down 10.9%	2.2	down 30.5%	16.8	up 1.3%	0.9	up 26.1%	5.4%	4.3%
down 9.0%	4.0	down 35.0%	28.1	down 4.6%	1.6	up 6.0%	5.8%	5.2%
down 6.1%	28.3	down 33.6%	157.2	up 2.0%	11.2	up 22.1%	7.1%	6.0%
down 11.5%	132.9	down 35.6%	471.0	up 7.5%	50.0	up 15.7%	10.6%	9.9%
up 1.8%	63.6	down 3.1%	197.4	up 4.4%	26.3	up 16.8%	13.3%	11.8%
down 5.6%	12.7	down 7.7%	60.6	up 1.1%	5.0	up 13.6%	8.3%	7.3%
down 3.5%	7.7	down 3.2%	30.8	down 1.0%	2.5	down 3.0%	8.2%	8.2%
down 2.2%	3.0	up 7.1%	28.0	up 2.8%	1.2	down 4.5%	4.3%	4.4%
down 16.9%	3.7	down 47.5%	66.7	down 0.1%	1.6	up 33.3%	2.3%	1.8%
down 13.5%	17.1	down 36.2%	43.4	up 2.0%	5.4	up 1.9%	12.4%	12.5%
down 7.7%	21.0	down 32.3%	138.0	up 0.3%	8.0	up 14.8%	5.8%	5.0%
down 5.0%	15.1	down 15.0%	134.6	up 8.5%	5.1	up 12.6%	3.8%	3.6%
up 2.4%	2.1	up 2.6%	11.7	up 1.2%	0.8	up 1.1%	6.6%	6.6%
up 2.6%	1.2	up 8.8%	7.3	down 2.2%	0.4	up 0.5%	5.3%	5.2%
—	2.6	up 1.4%	N.R.	—	1.0	down 24.2%	—	—
up 6.5%	18.6	up 8.0%	42.0	up 4.1%	5.2	down 17.4%	12.3%	15.5%
up 6.8%	17.2	up 11.2%	53.4	up 7.5%	5.6	up 9.8%	10.6%	9.6%
down 12.4%	1.7	down 65.0%	26.3	down 0.6%	0.6	down 20.5%	2.1%	2.6%
up 8.1%	2.4[3]	up 15.5%	19.8	up 6.4%	1.1[3]	up 22.2%	5.6%	4.9%
down 3.8%	9.6	down 16.8%	44.4	up 0.2%	3.4	down 0.6%	7.6%	7.7%
up 8.7%	16.1	up 3.3%	31.4	up 2.3%	5.6	up 4.7%	17.9%	17.6%
up 0.2%	10.7[1]	up 2.4%	42.5	up 11.3%	3.8[1]	down 10.1%	8.9%	10.0%
down 11.1%	84.5	down 18.4%	340.9	up 15.6%	34.6	up 27.9%	11.5%	9.2%
down 7.2%	1.7	down 52.4%	23.4	up 28.1%	1.3	up 264.5%	5.4%	1.9%

(1) Excluding extraordinary gains

(2) Fiscal year ends May 31

(3) Estimated

(4) Domestic and Canadian subsidiaries

(5) Fiscal year ends November 30

(6) Excluding dividends from General Motors

will be in packaging—which now accounts for 38% of Interchemical's sales.

Monsanto President Charles Thomas added to general enthusiasm, reporting a sales climb of 13% in the third quarter—traditionally the company's lowest volume period of the year. Says Thomas, "The indication is that the downturn that began in the last quarter of '57 has been arrested and that the outlook for the immediate future is improved."

Most spectacular gain was Wyandotte's whopping 264.5% earnings boost over the second quarter. President Robert Semple explains: "The quarter just ended began to reflect the satisfactory operation of the new ethylene oxide-glycol plant at Geismar, La."—which was going profitably by September.

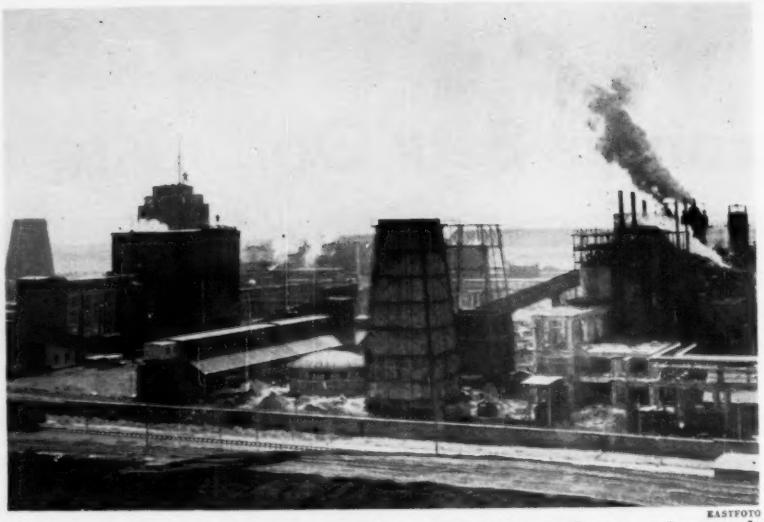
While volume in the third quarter and early weeks of the fourth quarter are seasonal peaks for glycol antifreeze products, Semple said, Wyandotte's final-quarter sales "should show continued strength and should compare favorably with those of '57."

But, although the majority of chemical reports were bullish, there were some soft spots.

Allied Chemical's nine-month profits were off 30% while sales sagged 9%. President Glen Miller blames vacation shutdowns at customers' plants in July and seasonal declines in sales of nitrogen products in the third quarter. Sales and income, however, increased steadily in August and September, boosting third-quarter earnings slightly over those of the April-to-June period.

Fourth-Quarter Boom? Rayonier President Russell Erickson, reporting that earnings nose-dived 65% in the first nine months, cites strikes during August and September at the company's divisions in Jesup, Ga., and Fernandina Beach, Fla., as factors in the decline. But, despite the disappointing performance in the first three quarters, early weeks of the fourth quarter have shown sales gains.

Almost without exception—even among those companies that weathered severe earnings declines earlier this year—management is optimistic about fourth-quarter prospects. And if big fourth-period gains fully materialize, year-end totals should be very close to those of '57.



EASTFOTO

At Bulgaria's Stalin chemical combine, expansion plans go forward.

Reds Step Up Chemical Pace

Behind the Iron Curtain this week, chemical industry bureaucrats are fitting together the pieces of a vast, new long-term expansion program. Details of the program were threshed out during the past few months at the separate national centers and at meetings of the East European Council for Mutual Economic Assistance* (COM-ECON). Bits of information about the plans are filtering out to the West.

Last week, Poland was host to a COM-ECON conference on developing the Soviet nations' "staple fiber" industries. The 400-man group will set binding standards for evaluating national staple fiber production plans, selecting equipment, ensuring production efficiency.

Polish Push: Also in Poland, plans were set to completely reorganize the chemical industry, along with the rest of the national economy, starting the first part of '59. The new system is different from the decentralization trend being established in Russia by Premier Khrushchev.

Instead of regional, mixed-industry control, Poland will set up new national "associations" to embrace all plants within specific fields. The chemical industry will be drawn together within 10 associations.

Bulgarian Boost: In Bulgaria, chemical managers are pressing for compliance with that country's '58-'62 five-year plan, which calls for 250% output increase.

If plans work out, nitrate fertilizer output will reach 330,000 metric tons/year; superphosphate, 560,000 tons. Construction of a 300,000-tons/-year nitrate plant is slated to start next year; it will be expanded to turn out 500,000 tons/year of ammonium nitrate by '65 or '66. The "Karl Marx" soda works will expand to produce 50,000 metric tons/year of edible salt, 250,000 tons of soda ash by '62.

At the Stalin Chemical Combine (above), urea output will be stepped up to 20,000 tons/year by '62, and Bulgaria's first PVC plant—a 6,000-tons/year unit—will start up by the end of that period. The combine will also get a new 15,000-tons/year methanol plant, a 20,000-tons/year formalin plant, and a plant to supply the glue for processing 145,000 cu. meters/year of timber waste into pressed-wood panels.

Bulgaria's chemical exports will also be stepped up. To meet foreign demands, output of the 88% grade calcium chloride has been increased, output of the 70% grade reduced.

Hungary, meanwhile, is stressing its synthetics growth, which tripled between '49 and '57. Polyester resin production gets under way this year. Other plastics will follow.

*Eastern Europe's counterpart of the Organization for European Economic Cooperation.

Retake on Caprolactam

Two prospective producers were reconsidering caprolactam's market potential last week, while a company already in production speeded up a major expansion.

Ohio River Chemical Co., joint venture of Spencer Chemical and Industrial Rayon Corp., is reining up on plans for a 20-million-lbs./year plant (*CW, Business Newsletter, July 19*). Said Spencer President Kenneth A. Spencer: "Construction has been postponed to permit the completion of further marketing studies." But, he adds, plans have not been shelved.

Commercial Solvents Corp., too, has slowed down plans to produce caprolactam by Dec. 1 (*CW, Aug. 23, p. 24*). New schedule: early '59. CSC says its primary objective now is to make use of other CSC products.

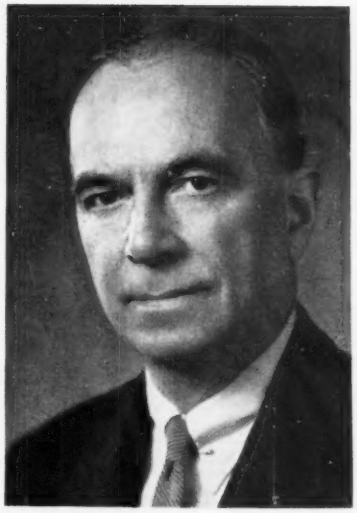
Meanwhile, Allied Chemical is increasing capacity at Hopewell, Va., to 60 million lbs./year, expects to be onstream by Jan. 1, several months earlier than first indicated. The question now seems to be, Will Allied's prospective competitors swing back to their summer optimism?

Aerosol Firm Acquired

Mojonnier Associates—one of the largest producers of aerosol filling machines—has been acquired in a merger that illustrates the increasingly close relationship among diverse industries: the buyer is an equipment-manufacturing subsidiary of a meat packing company.

Henceforth, Mojonnier Associates and the affiliated Mojonnier-Dawson Co.—both of Franklin Park, Ill.—will be operated as the Mojonnier Associates Division of Kartridg-Pak Machine Co. (Chicago), which is a wholly owned subsidiary of Oscar Mayer & Co. (Madison, Wis.), 75-year-old sausage processing firm.

Harold Mayer, president of Kartridg-Pak, said an extensive management study had indicated that his company's research, product development and engineering facilities could be advantageous in developing new products and expanding markets for Mojonnier, whose aerosol filling machines are widely used by packagers of drugs, cosmetics, chemicals, paints, etc. Named as general manager of the Mojonnier division: George Heath.



Ex-banker Wight steps up to president's post in sulfur company.

Freeport's New Chief

Freeport Sulphur Co. has a new president this week. He's Charles Wight, former chairman of the executive committee.

Langbourne Williams, stepping out as president, will continue as chief executive officer and chairman of the board. He had been president since 1933, and took the chairmanship last year when John Hay Whitney resigned to become U.S. Ambassador to Great Britain.

Wight joined Freeport in '48, after serving as vice-president of Bankers Trust Co. His post as executive committee chairman will go to Pearson Neaman, former senior vice-president and general counsel. Neaman will also continue as general counsel.

Cashing In on Wastes

Diversification into fertilizers—via a $10-million plant construction project—will be the next move in the expansion program of Bunker Hill Co., an Idaho mining concern.

Company President John Bradley says the proposed plant—with capacity of 200,000 tons/year of various fertilizer products—will use sulfuric acid now being turned out as a by-product at Bunker Hill's lead and zinc reduction plants at Kellogg, in the northern part of the state. Present acid production is 100,000 tons/year, but Bradley says this can be "substantially increased" through construction of more facilities for collecting and converting additional waste gases from the metals plants.

"This is a natural diversification move," says Bradley, "because Bunker Hill already has a strong basic position in production of low-cost sulfuric acid and technical experience and know-how in the mining, metallurgical and chemical fields." Also, Bradley adds that fertilizer consumption shows "strong and long-term growth characteristics."

The plant site is to be selected following completion of market and technical surveys.

Chemetron's Busy Week

Chemetron Corp. (Chicago) broke into the news twice last week. Both incidents involve its Chemical Products Division but are apparently unrelated.

- Chemetron filed a complaint in New Castle County, Delaware, chancery court against Catalysts and Chemicals, Inc. (Louisville, Ky.), charging the latter is threatening to violate an out-of-court agreement concerning use of trade secrets (*CW, April 19, p. 31*).
- Walter H. Girdler, Jr., a vice-president of Chemetron and president of its Chemical Products Division (Louisville, Ky.), has resigned and sold his 72,000 shares of common stock (out of 2.3 million shares outstanding) for $2.7 million.

Back in Court: Chemetron's latest court complaint stems from a suit brought one year ago against C&C, headed by Ronald Reitmeier, former research director of Chemetron's Girdler Catalysts unit (part of the Chemical Products Division). Seven other former Chemetron employees also joined the new company. Chemetron (then National Cylinder Gas Co.) charged that Reitmeier's company was using its trade secrets. In the settlement, C&C agreed to pay royalty to NCG on its catalyst sales, and agreed on a cross-licensing arrangement. C&C promised not to disclose trade secrets gained while its employees worked for NCG.

Now, Chemetron charges, C&C is threatening to violate the agreement by offering the trade secrets to "certain European manufacturers." Chemetron asked the court for a restraining and enjoining order and for an award of costs and disbursements.

COMPANIES

Mason Products, Inc., manufacturer of water-cooling towers, has moved its facilities in West Concord, Mass., to a new plant in Woburn, Mass.

•

Bausch & Lomb Optical Co. (Rochester, N.Y.) has acquired Pioneer Scientific Corp. (Great Neck, N.Y.), manufacturer of plastic ophthalmic lenses. Terms of the purchase were not disclosed.

•

Eclipse Fuel Engineering Co. (Rockford, Ill.) has purchased Lookout Boiler & Mfg. Co. (Chattanooga, Tenn.), which it will operate as a division. Lookout Boiler fabricates process steam equipment, water heaters and boilers.

•

Tennessee Products & Chemical Corp. (Nashville, Tenn.) has established a Southwest sales district to service Texas, Arkansas, Oklahoma and Louisiana. The company produces chemicals, metallurgical products, fuels and building materials.

•

Spencer Kellogg & Sons, Inc. (Buffalo, N.Y.) has purchased Staley Milling Co. (Kansas City, Mo.). The acquisition increases Kellogg's interest in feed manufacturing, which it entered in '57 through a merger with Beacon Milling Co. (Cayuga, N.Y.)

•

Degan Oil & Chemical Co. (Jersey City, N.J.) has been formed to process industrial vegetable oils and resins for paint, ink, rubber, petroleum and textile oil producers. Distribution will be handled by Geo. Degan & Co. (New York).

•

Wrenn Paper Co. (Middletown, O.) stockholders have approved terms for merger with Mead Corp. (Dayton, O.) (*CW Business Newsletter, Oct. 18*). Wrenn produces specialty paper fibers for laminated plastics.

EXPANSION

Polyvinyl Emulsions: National Adhesives (Canada) Ltd. is building a vinyl emulsion polymerization plant on the site of its laboratory at Toronto. Initial 5-million-lbs./year capacity can be boosted to 8 million lbs. Onstream target date: March 1, '59.

•

Formaldehyde: Reichhold Chemicals, Inc.—already producing formaldehyde at six plants in the U. S.—is planning to put a new formaldehyde plant onstream at Kansas City, Kan. by next April. The plant will be designed to produce 30 million lbs./year, and will cost about $500,000. Principal raw material, methanol, will be barged from Pensacola, Fla.

•

Asphalt: U.S. Oil & Refining Co. (Tacoma, Wash.) will expand its $10-million Tacoma refinery with the addition of a $750,000 asphalt plant. Completion date: Feb. '59.

•

Paper: Gulf States Paper Corp. (Tuscaloosa, Ala.) will begin a three-year program to modernize and expand mill facilities at Tuscaloosa and Demopolis. Program cost: $20 million.

•

Gypsum Products: Western Gypsum Products Ltd. (Vancouver, B.C.) will build a $2-million plant in Vancouver for production of gypsum board and plaster. Completion date: end of '59.

•

Oxygen, Nitrogen: Air Products, Inc. (Allentown, Pa.), is constructing a $2-million oxygen-nitrogen plant at New Johnsonville, Tenn. It will supply Du Pont's titanium dioxide plant there. Both plants are expected to be onstream in January.

FOREIGN

Petroleum/Austria: Capacity has been boosted at the abuilding Schwechat refinery, which will furnish ethylene for petrochemical plants of Hoechst and Montecatini-Stickstoffwerke (*CW, Business Newsletter, Oct. 11*). The refinery was originally planned to supply 7,500 metric tons/year of ethylene to the two plants. Now, Hoechst engineers have found that their plant alone will require 6,000 metric tons/year, rather than the original 4,000-ton specifications.

To meet the Austrian refinery's increased crude oil requirements, the Soviet Union has offered—under its new seven-year plan—to deliver 3.5 million metric tons of medium-sulfur crude, free of charge. The refinery's capacity boost implies continued reliance on Soviet crude source beyond '65.

•

Salt/Japan: Representatives of the Japanese salt industry will be in the U.S. early in November to negotiate manufacturing license agreements with Ionics, Inc., designers of an ionic membrane process for purification of salt. Japan now furnishes its domestic salt needs (except for chemical processing), hopes to become independent of the 2 million lbs. annually imported.

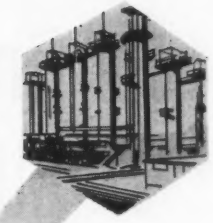
•

Olefins/United Kingdom: British Hydrocarbon Chemicals Ltd. will spend $16.8 million to double capacity of its Grangemouth, Scotland, plant. The new output, for captive use, will add 70,000 tons/year to existing 60,000-ton olefin capacity. Completion date: middle of '60.

•

Chemicals/Yugoslavia: Yugoslavian chemical imports continue to grow. It's estimated that value of imports this year will be $40 million, compared with $33 million in '57 and $30 million in '56. Heaviest demand has been for heavy chemicals and pharmaceutical raw materials.

THE PROFIT POINT



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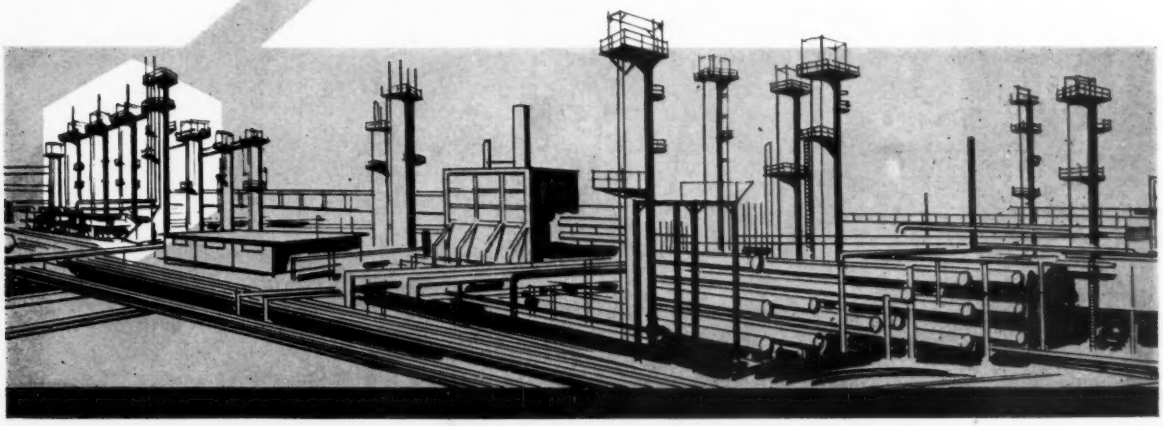

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TYPE OF COMPANY	NUMBER OF ORDERS	TOTAL DRACCO UNITS PURCHASED
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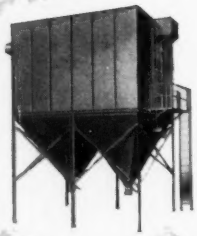
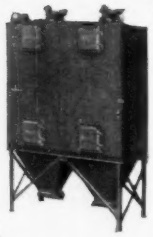
chemicals	13	28
chemicals	17	25
chemicals	14	19
refractories	35	54
refractories	8	27
mining	8	90
rubber	37	48
cement	15	31
stone products	14	15

*names on request



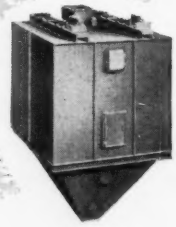
Multi-Bag Filters

Whirl-Clones



Dustomatic Filters

Uni-Filters



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Washington
Newsletter

CHEMICAL WEEK
November 1, 1958

A snarl of antidumping complaints is in the works at Treasury Dept. They were by U.S. companies that claim foreign items are being "dumped" in the U.S. at less than fair value—despite the new antidumping law.

The rash of petitions stems both from the vague language of the new law and Treasury's regulations, issued last week, which make it easier to claim unfair pricing on imports.

Importers of Japanese monosodium glutamate are the first to feel the teeth of the new law. The Treasury Dept., in its first ruling on antidumping petitions under the new law, ordered all shipments of this chemical held up pending further investigation. This is also the first chemical product on which Treasury has ruled.

At the same time, Treasury dismissed petitions filed against importers of aluminum foil from some 32 foreign nations. Almost unnoticed in the Treasury statement, however, was the fact that companies that bring in foil from the five major suppliers to the U.S.—U.K., West Germany, Switzerland, Austria and France—are still under investigation. The dismissal merely weeded out shotgun complaints against some countries that export little or no foil to the U.S.

More than 50 complaints remain on Treasury's list, with more coming in daily. The agency also dismissed complaints last week against importers of Canadian salmon and British fire hose because they had adjusted their prices as soon as they were notified of the complaints. Treasury does not make the complaints public until after it reaches an initial finding. The petitions then go to the Tariff Commission for a determination of injury to domestic competitors, then back to Treasury for an assessment of higher antidumping duties. But all imports challenged are frozen during the long and involved investigations.

•

Negotiations on construction of a helium extraction plant to be built in the Keyes, Okla., natural gas field have begun between the Bureau of Mines and The Fluor Corp. Congress voted $12 million for the project, which will increase U.S. helium output by 66%—adding about 240 million cu. ft./year to the current output of 360 million cu. ft./year.

The government hopes to bring the plant into production by Aug. '59, about eight months sooner than it would have under conventional procedure. The big rush, say Interior officials, is because helium is needed to alleviate "severe shortages" for defense, atomic reactor and industrial needs.

Interior's first call on construction jobs brought inquiries from about 80 companies. Fluor was chosen from a group of eight judged to be able to do the job and meet the completion date of Aug. '59. If for

Washington Newsletter

(Continued)

any reason a contract with Fluor isn't concluded, the Bureau of Mines will open negotiations with the next firm on the list of eight.

•

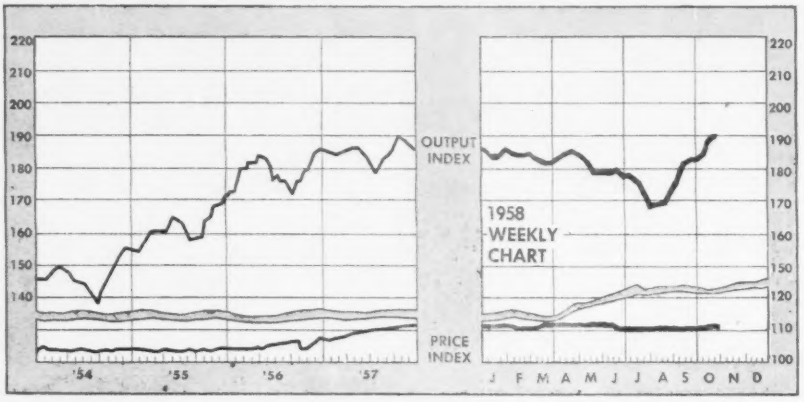
A revised Defense Dept. procurement regulation, due within the next month, will clarify the contract costs a defense producer can charge off as government-reimbursed expenses. For the most part, the changes will liberalize provisions dealing with costs for plant reconversion, advertising, interest payments, executive compensation, research and development, contributions, overtime and training.

The revision has been in the works for over a year, but has been held up by industry criticism that some of the proposed revisions would be more restrictive than liberal.

•

The first census of atomic industry manufacturers will be taken soon by the Census Bureau. It will cover all firms processing radioisotopes and ores, and those making reactors, reactor components, fuel elements and other products. Questionnaires covering '57 are now being sent out; forms covering 1958 will be sent out next January. From then on, the industry's activities will be covered annually by Census, just as other manufacturers are.

Data on number and value of shipments on 19 categories of equipment and products going to U.S. agencies, export and others will be requested. The survey was endorsed by representatives of companies involved at meeting with Census officials last August.



Business Indicators

WEEKLY	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1947-49=100)	190.3	190.0	190.5
Chemical Week wholesale price index (1947=100)	110.9	111.0	111.0
Stock price index of 11 chemical companies (Standard & Poor's Corp.)	46.17	46.12	39.21

MONTHLY Production (Index 1947-49=100)	Latest Month	Preceding Month	Year Ago
All manufacturing and mining	137	136	144
All chemical products	189	187	185
Industrial chemicals	198	196	207

In exclusive interview, Carbide's J. D. Benedito explains reorganization of plastics sales group.

Decentralizing for Faster Market Action

"It's a good example of decentralized responsibility and authority, with centralized planning and control." In those words, J. D. Benedito, vice-president, sales, for Union Carbide Plastics Co., described the substance of a major revision of UCC's plastic sales organization.

When changes take effect later this month, the new organization will have:

- Six regional sales areas that will operate much like any independently operated business.
- A new name—Bakelite Co. becomes Union Carbide Plastics Co. (*CW Business Newsletter, Oct. 25, p. 30*).
- Selling and technical service operations divorced from planning and specialized marketing activities.
- Separate product sales and market managers.

What led Bakelite to decentralize? Basic reason, Benedito tells *CW*, was "slowness in decision-making." Under the old organization, sales management was centralized in New York. Bakelite had eight selling divisions organized on a "process basis" (molding, extrusion, laminating and flexible packaging, etc.). Field sales personnel had to refer to New York for most decisions.

Selling personnel, moreover, were saddled with relatively large amounts of staff work. "A staff organization as such," said Benedito, "was lacking under the old setup."

Another serious problem was competition between sales divisions for the same account. Molding and extrusion salesmen would both bid for refrigerator-part business, for example. And, explains Benedito, "decisions made in

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one division obviously affected the other. No one spoke for Bakelite as a whole."

New Look: UCP's new organization is separated into selling and marketing services sections. The newly appointed director of sales (J. L. Rodgers) and the director of product marketing (T. W. Sharp) report to Benedito.

The sales director is assisted by five managers, one each for sales, national accounts, order and distribution, general services and inventory control. The sales manager supervises the activities of the six newly appointed regional managers (Chicago, Los Angeles, Hartford, New York, Cleveland, Moorestown, N.J.).

In effect, the regional managers are at the heart of UCP's setup. Each has authority to represent the company as an entity. Salesmen will continue to specialize, according to the type of process used by a customer, although some consolidations, says Benedito, are likely.

Regional managers will have, with some dollar restrictions, full authority on customer returns. And they will be responsible for setting and living within budgets, controlling office and traveling expenses, and for the direction of field selling efforts.

Moreover, regional managers will have some voice in determining warehouse inventories but will be responsible for losses in case of obsolescence. They will have no pricing authority, nor direct responsibility for hiring.

The national account manager is another departure for UCP's organization. He will be responsible for sales coordination, when a customer manufactures in more than one sales territory or is unusually large.

Planning and Control: These functions are centralized in the office of the product marketing director. His staff is comprised of an advertising manager, product market manager, and new-product market development manager. The product market manager's function is a unique concept, Benedito believes.

Two groups of managers report to the product market manager. Product sales managers for the principal product lines (polyethylene, phenolics, etc.) are in charge of over-all inventory levels, will become members of production scheduling and liaison teams. Object of the liaison team: to foster

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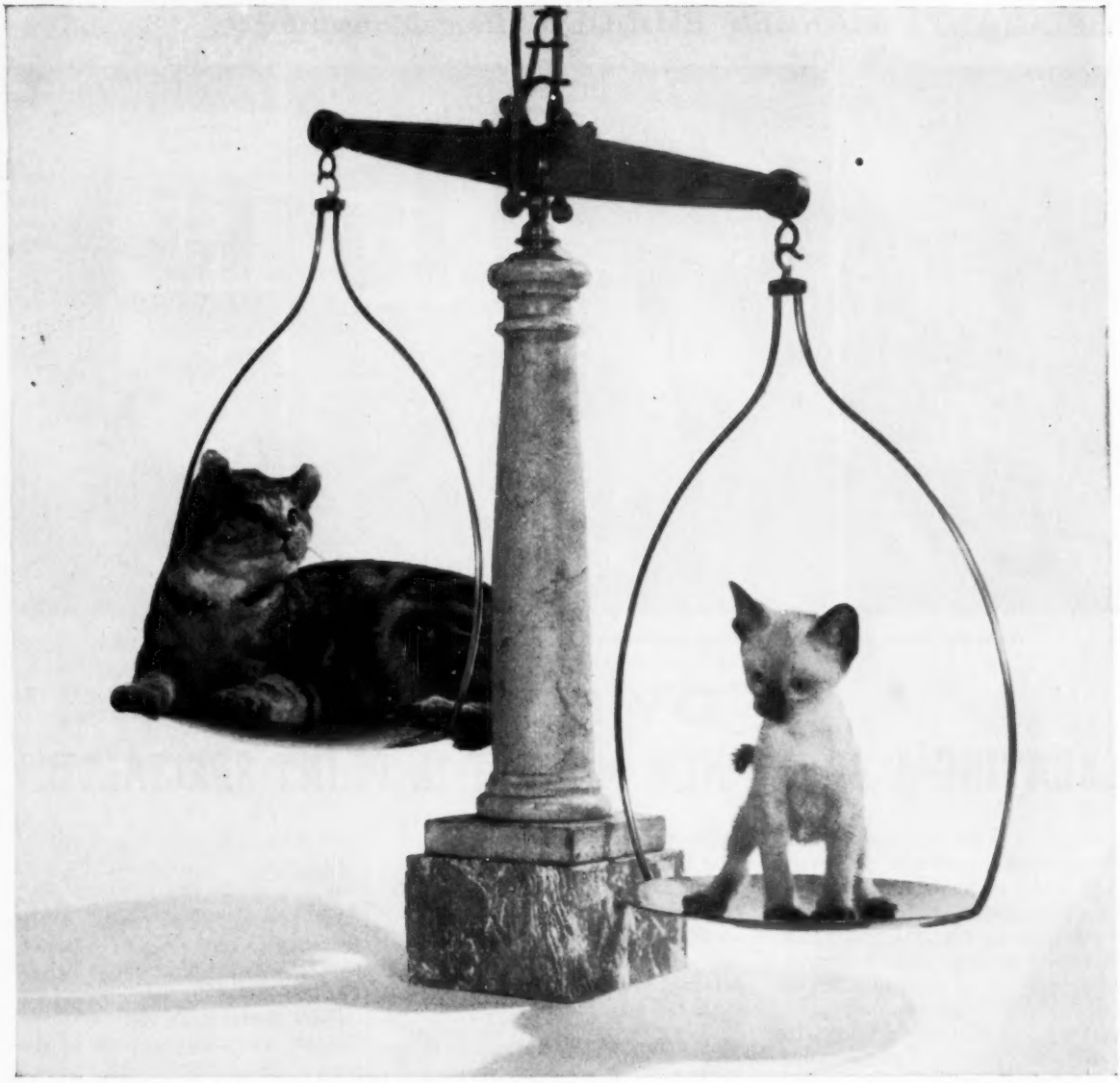

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A dip that keeps paintbrushes soft and usable indefinitely (and might also improve waterless hand cleaners).

DYTROL

CREATING A BRAND NEW MARKET IN PAINT SPECIALTIES

Perhaps it was the trio of properties: nonflammable, nontoxic, and nonvolatile that simultaneously triggered a sudden vigorous interest by a paint company and a specialty maker in a Monsanto product named Dytrol. These properties, coupled with an amazing affinity for solvating resins, have sparked what may develop into a new, large-volume item: a paintbrush dip that keeps brushes usable for up to a year without complicated, tiresome cleaning.

With the fall do-it-yourself painting season going full tilt, paintbrush sales are humping into another periodic upswing. An estimated 65-70% of these brushes will end up stiff, hard and unusable on the handy man's shelves, with most of their service life wasted because of improper cleaning. This innate laziness of amateur painters and this disregard of proper brush care are of deep concern to brushmakers and paint makers alike.

Amateurs tend to buy cheap brushes —on which there is less profit. And they often put off painting because each job requires new brushes. A new "preserver-softener" based on Dytrol may be the answer.

Oddly enough, the compound that may become the best specialty item yet for paintbrush care is not a good paint remover. Its solvating action on dried films is too slow. For brush care or for personal clean-up after painting, however, the pleasant-smelling liquid is outstanding.

What's most intriguing is the way it works: you can squeeze or wipe a brush dry of the excess of any oil-base paint, stand it in Dytrol for a little while, wrap it in paper and put it on the shelf. As long as a year later, the brush is still soft, pliable, ready to use.

The nontoxic compound simply plasticizes the paint to such an extent that it never hardens. And the liquid is so nonvolatile that it does not evaporate away to leave film-forming resin behind! When the brush is taken down for re-use, the plasticizer goes right into the new paint. Because Dytrol does not evaporate, brushes can even be left soaking from use to use, with no loss of liquid.

This "stay-put" characteristic can be valuable in restoring the pliability of stiffened brushes. The new brush "preserver-softener" is expected to have a lot of appeal for professional painters, too: by eliminating the tedious end-of-the-day cleaning with flammable, skin-irritating solvents.

In fact, this nontoxic liquid has an almost cosmetic effect on the hands. For that reason, it should attract the interest of makers of waterless hand cleaners. For cleaning paint off the skin, Dytrol is outstanding.

Dytrol has a highly pleasing odor, leaves the skin soft and smooth, and does not extract the natural skin oils as do ordinary paint solvents. It is so nonvolatile that it shows an absolute vapor pressure of only 1.1 mm Hg. at 160° C. As a result, makers of hand cleaners will hardly overlook its possibilities as a partial replacement for odorless kerosene in the hand cleaners used around paint shops.

Dytrol: Monsanto Trademark

For further information on Dytrol for use in paintbrush softening, request a copy of Specialty Data Report CS-10. Write today to Organic Chemicals Division, Monsanto Chemical Company, St. Louis 24, Missouri.

communications. It is comprised of members from research, sales, manufacturing and development operations.

Product sales managers in the broadest sense, says Benedito, "are responsible for the market health of their group."

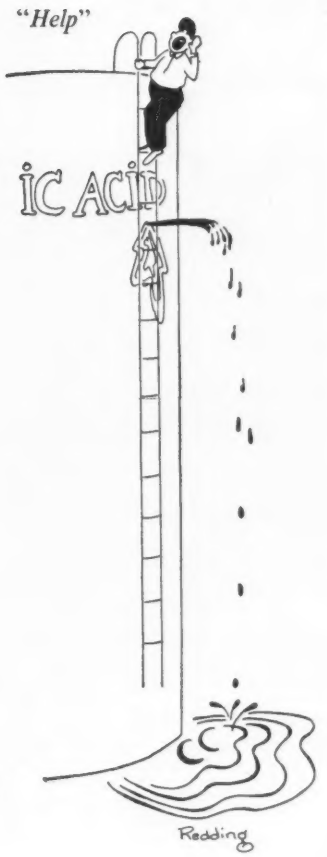
Somewhat different is UCP's conception of market managers, the other group that reports to the product market manager. Market managers are charged with establishing a comprehensive national sales program for specific markets. They suggest prices, terms, reseller policies, and advertising strategy. In establishing these functions, UCP has, to some degree, split the functions of the conventional product managers into those of product sales and market managers.

UCP will put its new organization into effect in about two weeks. A considerably longer period will probably be needed to implement all the results of the change. In the end, UCP anticipates an organization that will materially speed decision making and enhance the division's competitive position.

DATA DIGEST

- **Pigment Dispersions:** Several methods of dispersing pigment in paints, plastics and rubber through the use of cationic agents are covered in a recently released handbook. The booklet is divided into two parts: pigments in the protective coatings industry; pigment usage in plastics and rubber. Armour and Co. (Chicago).
- **Thiodiglycol:** A concise, revised bulletin is now available on this nonvolatile, water-soluble, chemically neutral liquid having high solvent power for vat, basic and acid dyestuffs. Physical, physiological properties, specifications, test methods, storage and shipping data are covered. Union Carbide (New York).
- **Demineralizing:** A new, comprehensive 40-page book deals with various methods of demineralizing water, compares demineralizers and evaporators. Included are flow diagrams, photos of installations, chemical results obtained from demineralization. Publication 5800, Cochrane Corp. (Philadelphia).
- **Phenolic Resins:** An eight-page bulletin discusses V-204 phenolic resins used for preimpregnation of glass fiber, asbestos, other suitable reinforcing materials. Eli Sandman Co.

Life in these excited states...



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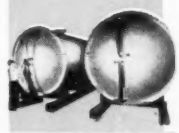

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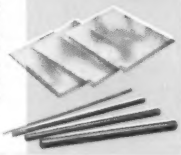

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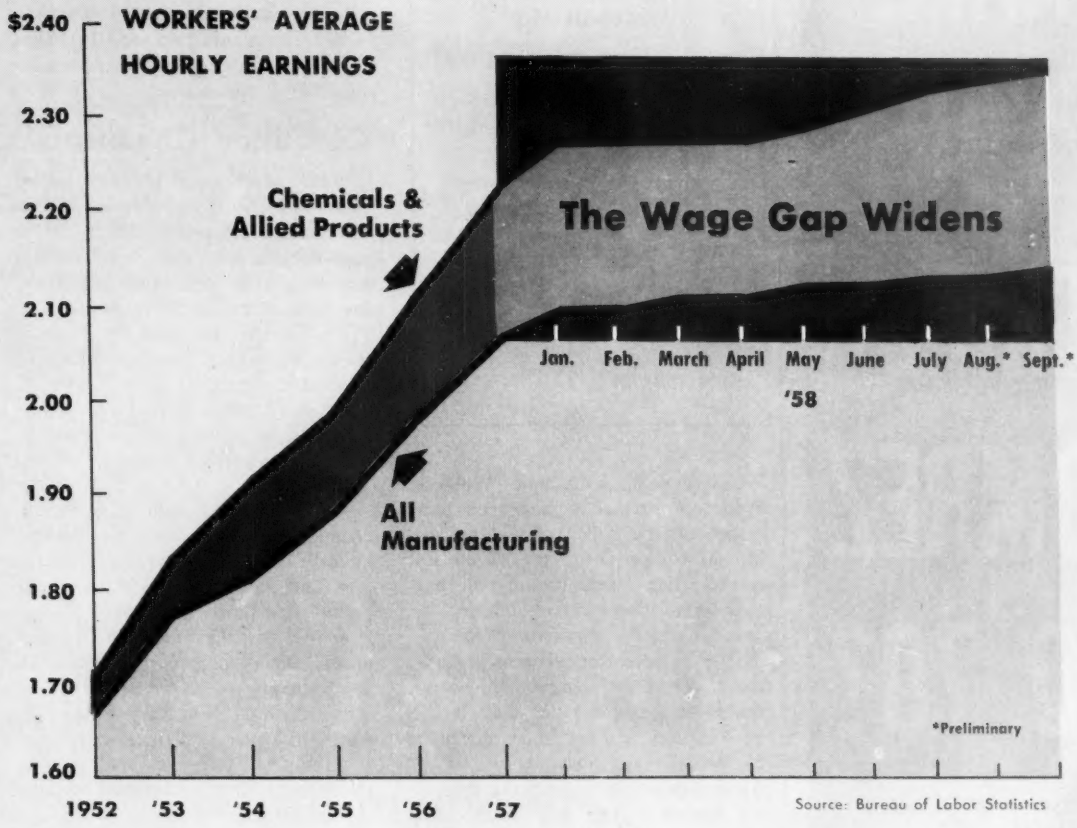

CPI Wage Rates—Still Setting the Pace

Despite a leveling off of cents-per-hour gains, it's evident this week that wage rates in the chemical and allied products industries are still climbing faster than those in industry generally. And there's no slackening in sight.

New wage figures by the U.S. Bureau of Labor Statistics show that in the chemical and allied products industries a brief interlude of steady earnings in the first quarter of '58 was followed by a rise from $2.27 to $2.35/hour—an 8¢ gain. In the meantime, all-manufacturing employees' average hourly earnings rose from $2.10 to $2.14 per hour—only a 4¢ gain.

Consensus is, of course, that the slackened rate of climb was due largely to recession-inspired economies. These would be in the form of decreased overtime or by a stand-fast attitude by management in negotiating new increases. Automatic cost-of-living increases, built into a number of contracts, also reflected the slower climb of the cost-of-living index.

Although average "weekly hours worked" in the chemical and allied products industries during the first seven months of '58 were consistently lower than those worked during any of the preceding seven years, in no case did the average dip below 40 hours/week. Lowest average in '58 was 40.6 hours, in February and in April; in June, the average rose to 41.1. In the prior seven years, the lowest monthly average was in '54, with 41.1 hours worked weekly. The highest average, 41.4 hours, was in '55.

It's plain that most hourly chemical employees who have continued working have enjoyed a fairly full workload and have not suffered any sharp wage losses. And now it's apparent that wages are again climbing.

Layoffs Hurt: But layoffs have been keenly felt. Union economists are saying that although business is unquestionably picking up, many jobs that existed prior to the recession have been eliminated. Unions argue that the business upturn is being accomplished without much benefit to laid-off employees. In essence, they say, it's an automated upturn.

Such reasoning, of course, is basic to bargaining plans of the unions. The

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Most gains: 7-12¢/hour

Union settlements, first-half '58

	ICWU (All Plants)	OCAW (Over 50 Men)
	Number of settlements	
No increase	15	2
1-3¢/hour	1	4
4-6¢	39	26
7-9¢	54	42
10-12¢	54	26
13-15¢	6	10
Over 15¢	2	4

Oil, Chemical & Atomic Workers Union, in particular, has been outspoken on the policy of seeking additional compensation for employees in industries where automation has made broad strides in consolidating or, says the union, "eliminating" jobs.

After its recent convention in California, OCAW's bargaining policy committee reaffirmed the goals it set last February. At that time, it called for annual wage increases of 3.5%, plus cost-of-living adjustments, protection against layoffs and longer-term contracts, with annual wage improvements based on productivity and living costs. Conventioners said those are still OCAW's goals but added that an alternative of a 25¢/hour wage increase was acceptable, leaving it up to the company or plant which alternative would be preferable.

If the gains in average hourly earnings follow the minimum trend set in recent months, it's conceivable that by year's end the chemical and allied products workers' wage will reach the neighborhood of $2.37. This would amount to an increase of about 10¢/hour over the $2.27 paid last January and would be equivalent to an over-all increase of 4.4%.

So far, there's little indication that won't happen. A glance at the wage gains of the International Chemical Workers Union and OCAW for first-half '58 (*see table*) shows that most wage increases won or awarded in first-half '58 are in the order of 7-12¢/hour, just the sort of gains likely to produce the 4.4% increase.

Management's chances to hold the line on wage costs are not very good. With business on the upswing, management can expect even tougher wage demands designed to offset so-called job elimination and to maintain the momentum of increases already well under way.

Carolinas' Chemicals

Value of chemical products manufactured in North and South Carolina has jumped more than 300% in the past decade, and state and community leaders in both states are working hard to maintain the pace.

This is the consensus of a report on the chemical industry in the Carolinas featured in the current issue of Wachovia Bank & Trust Co.'s monthly magazine. The bank has branches throughout North Carolina.

Latest data:

- Nearly $600 million worth of chemical products were manufactured in the Carolinas last year.
- The South makes a third of the nation's chemical products.
- 70% of the chemical facilities under construction in the U. S. at the beginning of this year were being built in 15 Southern states.
- In North Carolina alone, some $80 million is being invested in construction of 10 new chemical producing facilities.
- North Carolina already ranks 13th in the U. S. in chemical-industry expansion.
- South Carolina's chemical industry is second only to its textiles in value of output, a climb from fifth place since '47. [In the Commerce Dept.'s just-released '56 annual survey of manufactures, South Carolina registered the greatest increase between '54 and '56 in the production of chemicals and products. An increase of 128% jumped the state from 18th to 13th in the list of the top 20 chemical-producing states (*CW, Oct. 25, p. 92*).]

Significant expansion in the Carolinas has occurred in the production of synthetic fibers, industrial chemicals, hyperpure silicon and basic chemicals.

The production of paints, sulfonated oils and drugs has also increased substantially, and development of nuclear energy production, power and testing facilities appear to be centering in the two states.

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Foreign Capital Spending Plans Of U.S. Process Industries

	'57 Actual	'58 Estimated	'59 Planned	Percent Change from '58
		(million dollars)		
Chemical	$32.0	$72.0	$43.0	—40.3%
Drug	20.0	30.0	25.0	—16.6
Paper	48.0	14.0	13.0	— 7.1
Rubber	36.0	25.0	33.0	+32.0
Oil	876.0	771.0	767.0	— 0.52
Total foreign expenditures	1,012.0	912.0	881.0	— 3.4
Total domestic expenditures	2,331.0	1,998.0	1,961.0	— 1.9

Source: Lionel D. Edie & Co. survey of 40 companies.

Foreign Spending Drops Off

Companies making up a major part of the U.S. chemical industry will slash their foreign capital spending in '59 to almost half their '58 total (see table).

This highly significant development is revealed in a just-released survey by Lionel D. Edie & Co. of 40 key companies in five chemical and allied industries. The survey, which withheld company identifications and the number of firms responding from each industry, points out that all but one of the five industries queried expect to cut back foreign capital expenditures next year.

[The survey preceded by a few days the announcement that Congress will open hearings Dec. 1 on the subject of providing special tax inducements to encourage U.S. investments abroad. Hearings will be conducted by Hale Boggs (D., La.), chairman of a subcommittee of the tax-writing House Ways & Means Committee.]

Chemical Decline Highest: The chemical industry itself reports the largest planned cutback of foreign spending, some 40.3%. Total outlays by the five industries as a whole are expected to decline 3.4% from this year's expenditures.

The '59 cutback, however, is not expected to be as severe as was the drop between '57 and '58. Estimated foreign expenditures in '58, by the same 40 companies, were only 90.1% of the previous year's total.

Total planned domestic capital expenditures of all the surveyed companies will show a drop of 1.9% in '59, according to the survey.

All-Industry Picture: In partial support of the trend represented in the Edie survey are these developments in foreign capital investments of all U.S. industry as reported in the Commerce Dept.'s recent Survey of Current Business:

- First-half '58 direct private foreign investments are much lower than they were in first-half '57.
- Direct private foreign investments in western Europe in '57 were 10% less than in '56 (omitting purchases of large petroleum properties from the U.K. in '56).

Other U.S. private foreign investment developments in '57 reported by the Commerce Dept.:

- Total direct investments of $4 billion raised the cumulative total to $37 billion.
- Direct investments of $3 billion in foreign branches and subsidiaries raised total book value of such investments to $25 billion.

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ADMINISTRATION

Strike Sets Record

A strike of construction workers in the Beaumont-Orange-Port Arthur area of Texas ended last week after it had set a 90-day record for work stoppage in the state and had prolonged the holdup of many millions of dollars' worth of oil and petrochemical construction. Previous record was 83 days, set in the same area in '56, also by construction workers.

The tieup was started by three local unions making up the Sabine Area Council of Carpenters. For about six weeks, iron workers also were on the picket lines, but they came to terms with management's negotiating group, the Sabine Area Construction Committee (SACC).

SACC handles contract bargaining for Du Pont, which maintains its own construction division, and for area and national contractors engaged in big industrial jobs. It had reached agreements with all crafts except the carpenters. Most of these are three-year contracts calling for pay increases totaling 40¢/hour.

Now, carpenters' locals have ended the tieup by voting to accept a three-year contract with an hourly pay increase totaling 40¢, including 12½¢ now, 12½¢ in April '59, 7½¢ in Jan. '60, 7½¢ in April '60. Some 4,300 men idled by the stoppage began returning to work last week, including construction workers.

LABOR

Tuscola Settlement: A strike of 900 employees of the U. S. Industrial Chemicals Corp. (division of National Distillers & Chemical Corp.) was settled last week when employees voted to accept terms of a company-proposed contract.

According to reports, the contract closely followed offers made by the company prior to the strike. Settlement by Local 515, International Brotherhood of Operating Engineers, calls for a 20¢/hour across-the-board wage boost and additional wage increases, depending on jobs. Some liberalization of fringe benefits is also included. Full terms of the agreement have not been disclosed.

•

Du Pont Tally: At two Du Pont plants, employees will vote on representation by national unions; and at another plant, a layoff is under way.

At the company's Belle, W. Va., works, 1,900 employees vote this week on whether or not they will be represented by the Oil, Chemical & Atomic Workers Union, while at Chattanooga, Tenn., 1,160 employees are voting on accepting the leadership of the Textile Workers' Union of America. Alternative: no union. In an election three weeks ago, employees ousted their independent bargaining union, but failed to muster enough votes in favor of an alternative.

Meanwhile, at the company's Orlon fiber plant in Camden, S. C., some 150 employees are being laid off. The plant had cut the work week to 36 hours in an attempt to avoid the layoff, but this only retarded it.

IDEAS

Puerto Rico Profits: Frank bid for U.S. investors is a new illustrated 16-page color booklet describing the profit positions of over 500 U.S. producers in Puerto Rico. It has just been published by the Commonwealth's Economic Development Administration in New York.

The brochure "Puerto Rico Profits and You" notes that net return on sales for the island's "Operation Bootstrap" plants is three times as high as similar returns in the U.S.

The booklet also shows figures comparing net profits of Puerto Rico's tax-exempt firms with their U.S. counterparts, including the chemical industry companies.

A special section is devoted to statements from top officials of U.S. companies with affiliates in the Commonwealth, and there's a comprehensive list of Puerto Rico's raw materials and newest products.

The booklet is available from Dept. PR, Commonwealth of Puerto Rico, 666 Fifth Ave., New York, N. Y.

•

Technical Executive Boom: According to a just-completed survey (copies on request) by Hoff, Canny, Bowen & Associates (New York), 1959-60 will see the beginning of a new surge in demand for technically trained executives. Object of the study: to determine if technical-executive demand is a barometer of the swings in the national economy.

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WIDE WORLD

Judge Lawrence: His opinion severely limits President's tariff powers.

LEGAL

Tariff Fight Appeal: The U.S. government has said it will appeal a recent Customs Court ruling that would severely limit Presidential freedom in making "escape clause" tariff decisions. Many chemical process products could be affected by the restriction.

The ruling says the President may accept or reject only those changes in duties recommended to him by the Tariff Commission (*CW Washington Newsletter, Oct. 18*). In the past, the President has been free to make changes in recommendations offered by the commission.

The Customs Court ruling made invalid a '55 Presidential proclamation increasing tariff rates on imported bicycles. It is also expected to affect the quotas President Eisenhower imposed recently on lead and zinc imports, could nullify import-restricting "gentlemen's agreements" between the President and foreign countries.

The court, in its opinion, written by Judge Charles D. Lawrence, said its decision "presents a problem of far-reaching importance." It marks the first time in the history of trade agreements litigation that the President's use of tariff powers was ruled invalid.

Under the escape clause of the reciprocal trade agreements act, domestic industries that feel they are being hurt by imports may seek relief through Presidential action on the Tariff Commission's recommendations.

KEY CHANGES

Anton G. Kettel to administrative vice-president and **Arthur C. Von Oehsen** to manager, new-products coordination, Chas. Pfizer & Co. (Brooklyn, N.Y.).

James K. Everhart, Jr., to secretary and general counsel, Hagen Chemicals & Controls (Pittsburgh).

Gerald J. Higgins to assistant to the president, American Latex Products Corp. (Hawthorne, Calif.).

Fred W. Thomas to director, Spencer Kellogg and Sons (Buffalo, N.Y.).

William G. Knapp to division manager, Abbott Laboratories International; and **Cornelius B. Evers** to manager, South Africa Division of Abbott Universal Ltd.; affiliates of Abbott Laboratories (North Chicago).

Arthur Phillips, Jr., to vice-president, Solvay Process Division, Allied Chemical Corp. (New York).

J. Ed Warren to chairman of the executive committee and director, Cities Service Co. (New York).

Howard E. Everson to assistant director of research, Diamond Alkali Co. (Cleveland).

Rollen A. Mack to president, A. J. Lynch & Co. (Los Angeles).

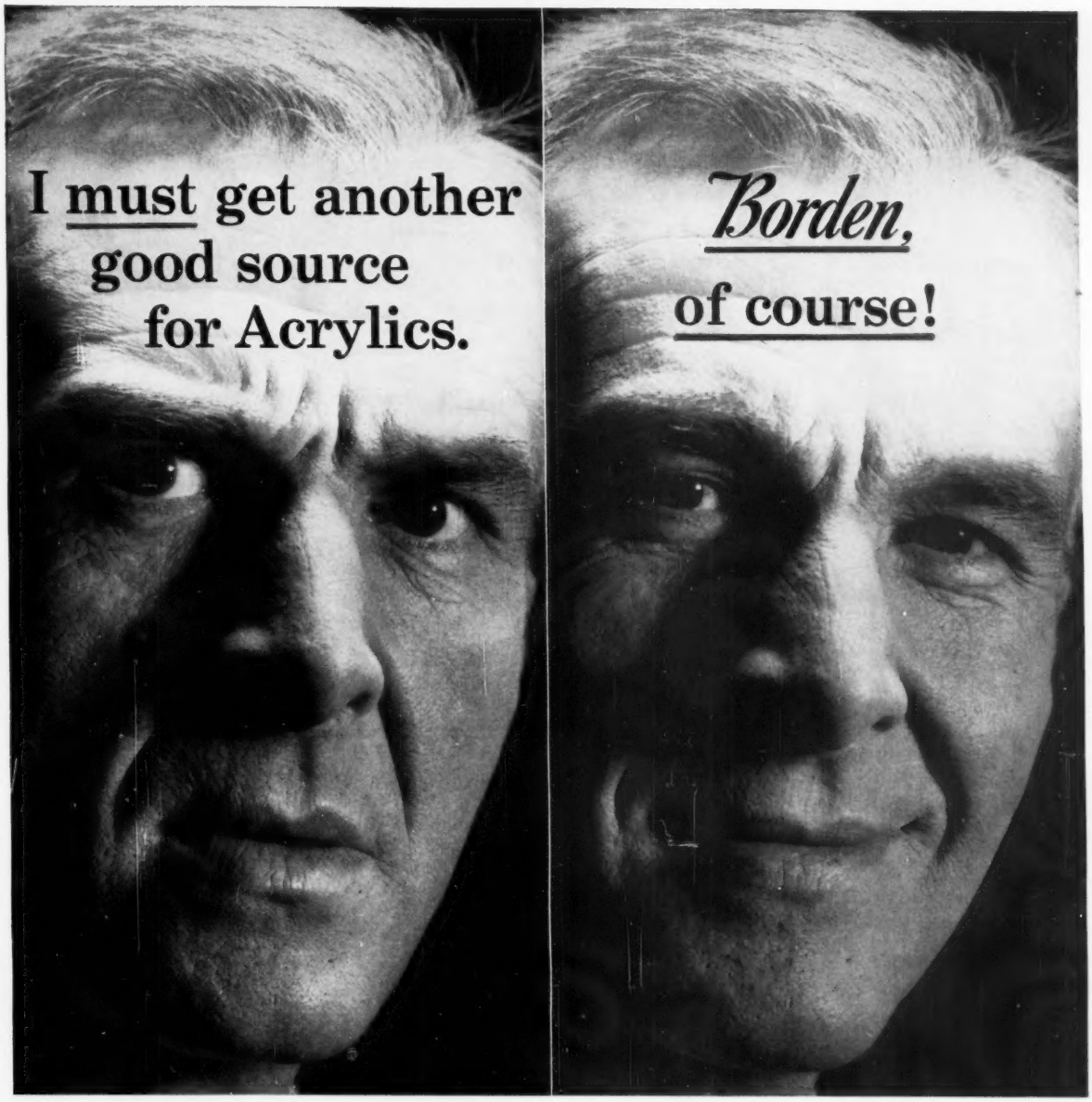
J. M. Ewell to vice-president—manufacturing and employee relations; **C. K. McCracken** to vice-president—corporate affairs; and **D. P. Fite** to controller; all of Procter & Gamble (Cincinnati).

Albert P. Gagnebin to vice-president, and **Joseph M. Weldon** to assistant vice-president, International Nickel Co. (New York).

KUDOS

To **Emil G. Klarmann,** vice-president in charge of technical services, Lehn and Fink, the Achievement Award of the Chemical Specialties Manufacturers Assn.

To **Sidney Werthan,** manager, Paint Research Laboratory, New Jersey Zinc Co., the '58 George B. Heckel Paint Industry Award, presented by the Federation of Paint and Varnish Production Clubs.



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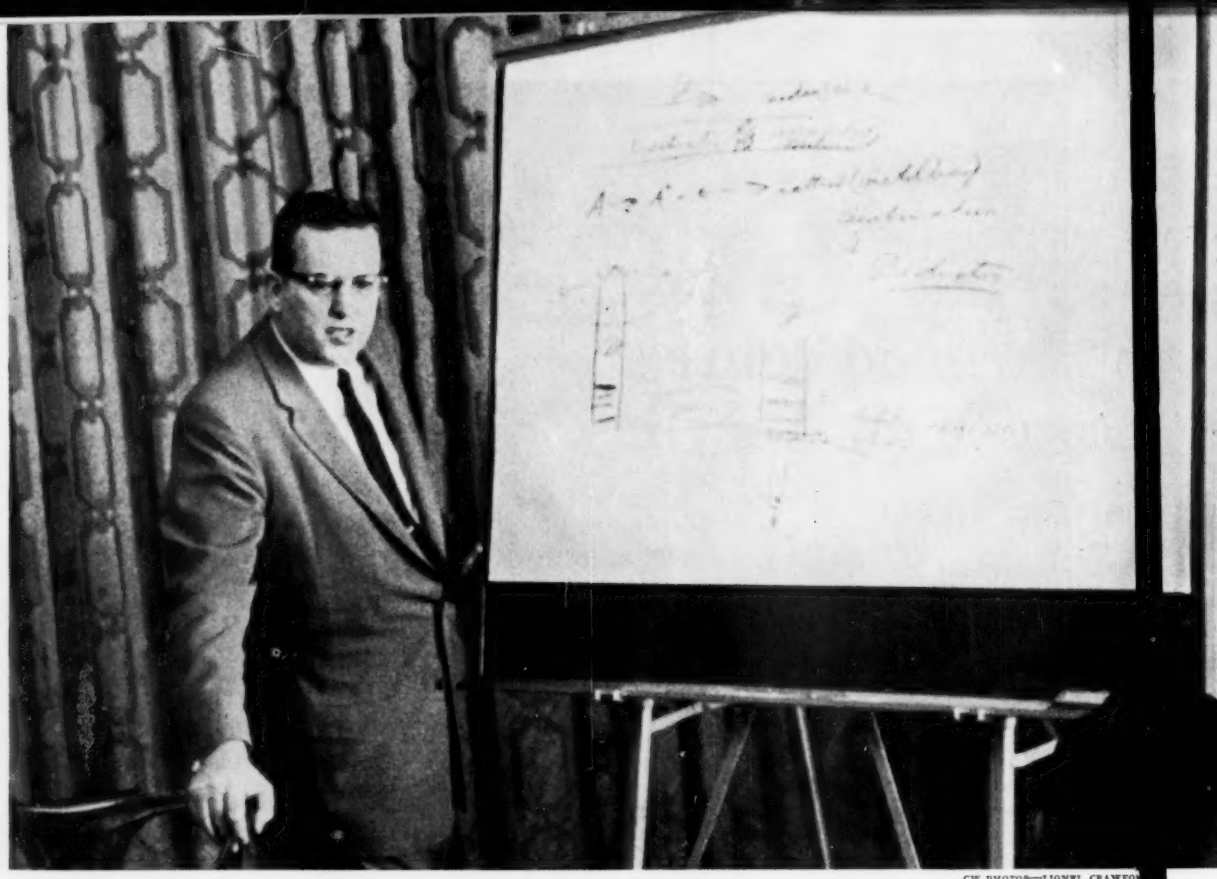
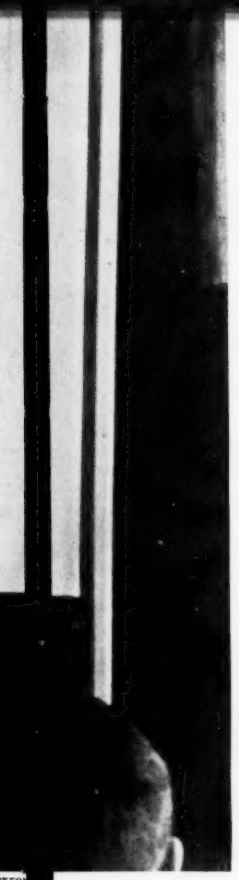


CW PHOTOS—LIONEL CRAWFO

Bolstering the Case for Low-Cost

. . . For wet blasting, try slurried or plastic-coated nitrates . . .

Low cost, safety will push ni-



Utah's Cook: 'The changing scene in explosives: a big shift to use of ammonium nitrate-fuel oil mixture.'

Explosives

trate sales up, dynamite out . . .

AMMONIUM NITRATE-fuel oil combinations have successfully blasted their way into dry explosives applications. Reverberations of these gains will soon be felt in the wet blasting market. Authority for this forecast is explosives expert Melvin Cook, of the University of Utah. Cook has been striving to develop techniques for utilizing ammonium nitrate in wet applications —an effort that has had plenty of attention from explosives manufacturers.

Cook, just back from a European conference on explosives, thinks the best bet for making cheap ammonium nitrate useful for "wet" hole work is to put it into a slurry, adding water and TNT. He's also concentrating on ammonium nitrate-nitrobenzene-2-nitropropane-water mixtures, thinks they may work even better. Says Cook, "contrary to popular belief, water (in quantities up to 10%) often aids an explosion by promoting an energetic reaction, cooling gases and shifting the reaction equilibriums in the right direction."

Others Research Too: Cook isn't the only one searching for better nitrate explosives. A spot-check in the industry shows a variety of other projects. Among them:

- Monsanto: a spokesman reports that it is "working on ammonium nitrate "wet" hole explosives, taking a different approach—packaging the nitrate in plastic, or coating the nitrate particles."
- Du Pont: Robert Cavanaugh, director of research of the explosives department, is most optimistic about his firm's Nitramex 2H, TNT-ferrosilicon-ammonium nitrate in a metal can. To create the Seymour Narrows underwater blast at Vancouver, B.C., earlier this year, 2.75 million lbs. were used. Cavanaugh says the Nitramex—it took the company two years to develop it—is selling well; sales are "already running over $1 million/-year."

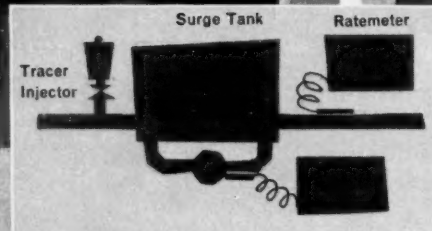
Economic Spur: The changing scene in explosives sales, with the trend toward ammonium nitrate, is playing havoc with earnings figures of leading explosives manufacturers. Popular for just a few years, ammonium nitrate last year supplied nearly a quarter of the civilian explosives market. And it is reportedly responsible for the closing of Atlas Powder Co.'s nitroglycerine plant at White Haven, Pa. Its much lower cost in addition to the mixture's relative

. . . There's future in metal forming, hardening with explosives . . .

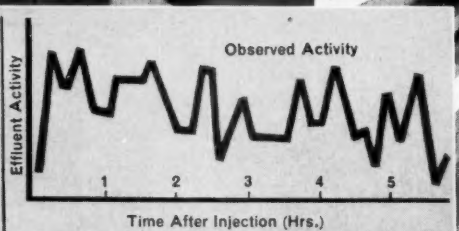
When the Quality of the Mixing is Important

From motor fuels to breakfast foods, most industries have a mixing problem somewhere along the line. Determination of proper and practical mixing techniques is important, and frequently difficult with conventional analytical methods. But with radioisotopic analysis the evaluation of mixing efficiency* is simple, fast and economical. It is only necessary to tag one of the components of the mixture with a radioactive compound and then measure the radioactivity either continuously or in aliquots from different regions during or after the mixing process.

The oil refining industry has made use of this method of mixture evaluation most effectively. For instance, feed stocks to a cracking plant came in two streams,



1. Radioisotopic compound is injected into one of the feed stocks. Stocks are blended in giant tank and radioactivity in outlet stream is followed.



2. Fluctuations in radioactivity persist for several hours, showing mixing is incomplete with this system.

Radioisotopic Analysis Can Help Maintain It

one of varying high viscosity and one of low viscosity. These had to be blended to produce an oil stock of constant viscosity. To reduce viscosity variations the mixture was fed into a 50,000 bbl. "surge" tank and recirculated at the rate of 100,000 bbl/day. Despite this vigorous effort to attain uniformity, the stock leading to the cracker still showed abrupt and severe fluctuations in viscosity. The degree of mixing was then evaluated by adding 50 millicuries of Zr^{95} in an oil soluble compound to a stock inlet pipe. Radioactivity at the stock outlet pipe was measured with counters conveniently attached *outside* the pipe. The inhomogeneity of the mixture could then be estimated from the fluctuations in radioactivity.

Mixing evaluation by radioisotopic analysis is widely applicable to a variety of industrial uses. For instance, it has been used to measure mixing of fine dust in the air of ventilated coal mine passages, to analyze the flow of sewage and industrial waste in moving bodies of water, to detect non-uniformity of flow of liquid in refinery distilling columns, and in many other situations where it is important to know how much mixing has taken place.

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**We have prepared a technical description of procedures used in mixing evaluation by radioisotopic analysis and will be glad to send you a copy on request. Ask for Technical Bulletin No. 2.*

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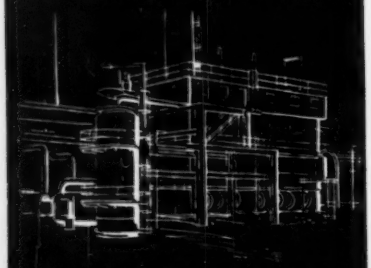

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'More work on theory is needed to understand detonation.'

safety have turned the tide (commonly used explosives cost 9-25¢/lb.; waterproof explosives, 14-22¢/lb.; but the ammonium nitrate-fuel oil mix costs only 3.5-4¢/lb.).

Cook feels that "it's a good trend," would like to see the use of dynamite and other explosives diminish, since wider applications of the cheap mixtures will "ease handling, improve safety and in the long run may increase the use of explosives." Emphasizing Cook's point about safety, Monsanto explains that ammonium nitrate's critical mass (the mass at which a reaction will change spontaneously from a burning to a detonation reaction) is 123 tons, compared with TNT's 1 ton.

But there is one problem arising from the fact that fertilizer-grade nitrate is useful as an explosive. It appears that some municipalities (e.g., Baltimore, New Orleans) are now wary of ammonium nitrate's explosive characteristics, may tighten ordinances on its storage and handling.

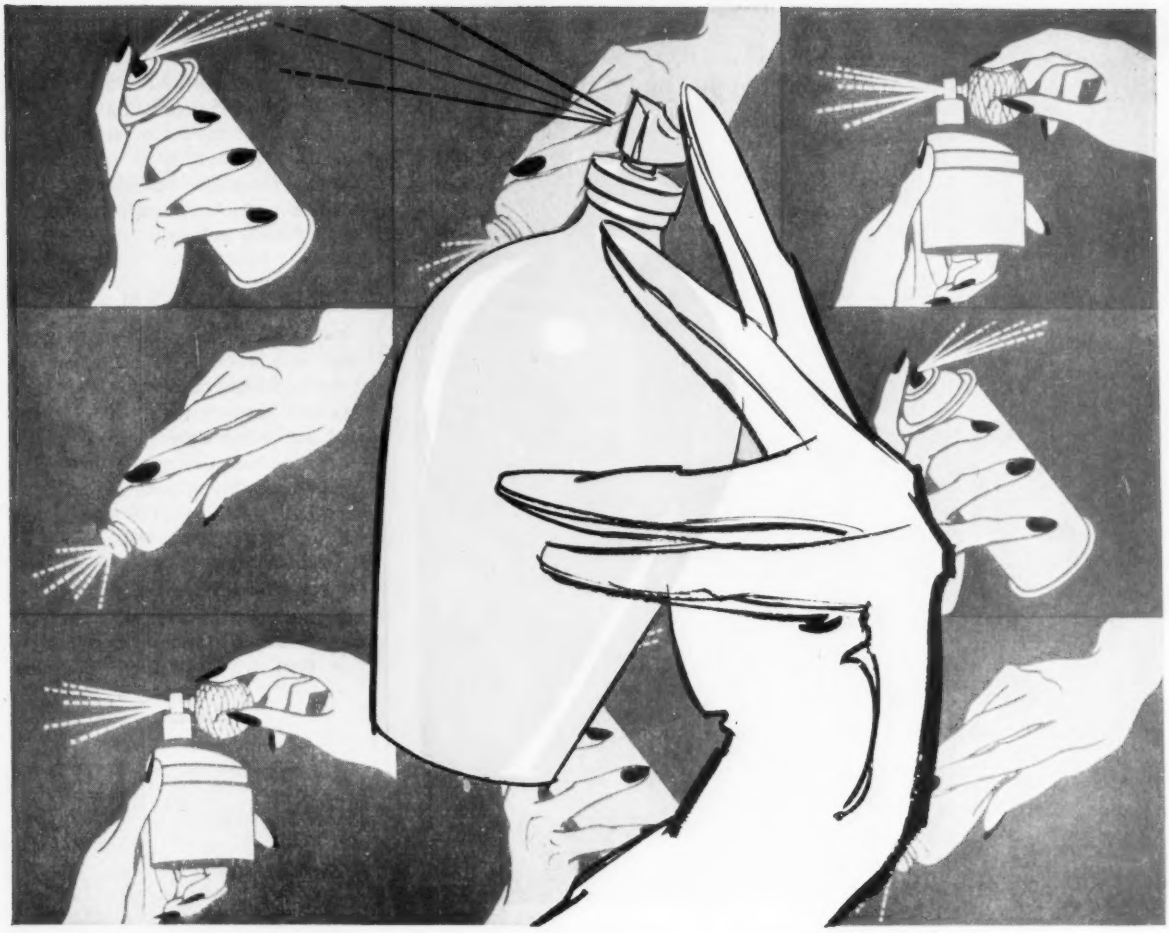
Gains in Theoretical Research: Cook is probing detonation theory, has come up with some controversial ideas. He believes that a "plasma" is formed in "front" of an explosion — a pocket of ionized gas with a metallic-like lattice formation, in which the bonding energies are rapidly reduced; when there is nothing to hold the lattice together, it disintegrates. During its brief lifetime, Cook says, "the plasma emits radio waves, creates high temperatures, and produces current pressures up to 40,000 volts." He admits, however, "it has no practical value today, but as a theory it will contribute to our knowledge of explosives."

At least one leading explosives man believes Cook will run into "vehement disagreement" on his theory at the upcoming Symposium on Mining Research at the Missouri School of Mines, Nov. 12-15.

Sidelines: Explosives research has also touched on other areas. Cook's work carries him into unique sidelines, including forming of metals,* whereby metals are "blown" into dies to shape them. Du Pont is working on this, too, and is also researching surface-hardening metals with explosives. It has developed a sheet explosive that, according to Cavanaugh, "when placed on metal surfaces and detonated, simulates the effect of hammering the metal."

Other searches continuing in the civilian field include strain effects in rock, basic studies in velocity of

*Cook formerly worked for Du Pont as an explosives researcher and consultant, is now a professor of metallurgical engineering at the University of Utah (he heads its Explosives Research Group) and is a director of the Intermountain Research and Engineering Co. He is author of the recently published "The Science of High Explosives."



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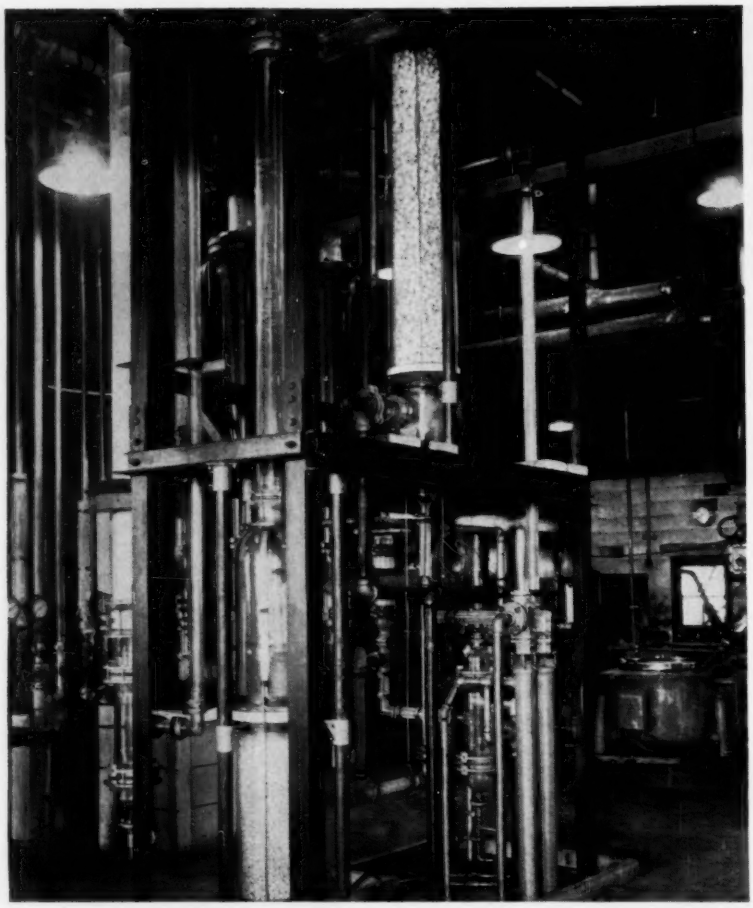

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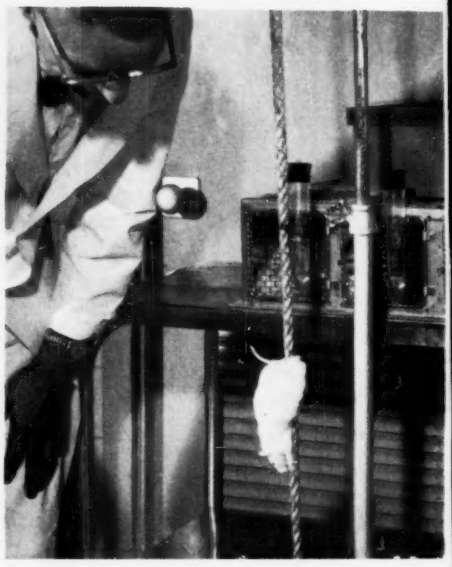
RESEARCH

detonation, improved blasting caps, delay fuses and detonating cords.

But, as one explosives researcher put it, the big push is in practical industrial research—with the aim of restabilizing the economics of this normally stable industry.

EXPANSION

- Denver Fire and Clay Co. (Denver) is building a research and development laboratory to develop refractory products for missiles, rockets and nuclear processing.
- Escambia Chemical Corp. (New York) recently dedicated its new research laboratory at Wilton, Conn. The controversial lab (*CW, Nov. 24, '56, p. 98*) will be used exclusively for chemical research, including pharmaceutical intermediates, chemicals for plastics and synthetic organics.
- Brooklyn College of Pharmacy



Trained Rat Throws

Normally, the trained rat climbs the rope in seconds. But after injection with blood from psychotic human beings, he fumbles (*above*) or "freezes," staring into space. Such rat tests, reported by Merck Sharp & Dohme scientists Charles Winter (*right*) and Lars Flataker, furnish new evidence that mental illness is accompanied by changes in blood chemistry (*CW Technology News-*

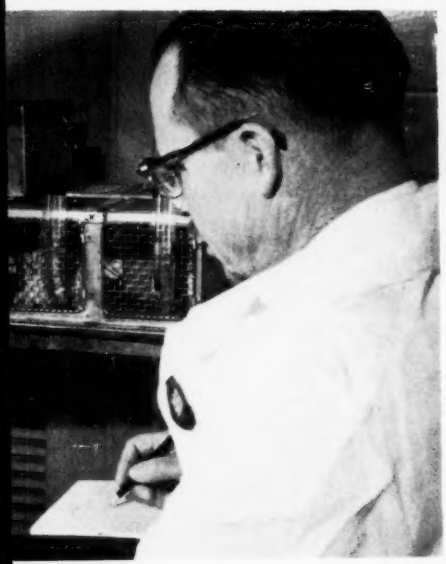
(Brooklyn, N. Y.) will dedicate new laboratories for therapeutic research this month.

• National Bureau of Standards' Cryogenic Engineering Laboratory (Boulder, Colo.) has established an information center. It will serve as a clearing house for research and development references in cryogenic engineering, but will not be a library.

• Construction is under way on a $500,000 wing to the main building of Midwest Research Institute (Kansas City, Mo.).

• Monsanto's new agricultural research laboratory (St. Louis) is now in operation, provides space for a possible 75% future expansion.

• Construction of the Niagara Frontier's first nuclear research center is expected to get under way in three months. The 100-kw. nuclear reactor, to be built at University of Buffalo, will begin operation about July '60.



Light on Mental Ills

letter, Oct. 25). Blood from nonpsychotic human beings does not affect rat behavior. A blood substance associated with the abnormal behavior has not yet been identified. But Winter and Flataker hope to establish the fraction of the plasma containing the toxic material, identify the guilty compound, determine its biological properties, then find methods to offset its action.

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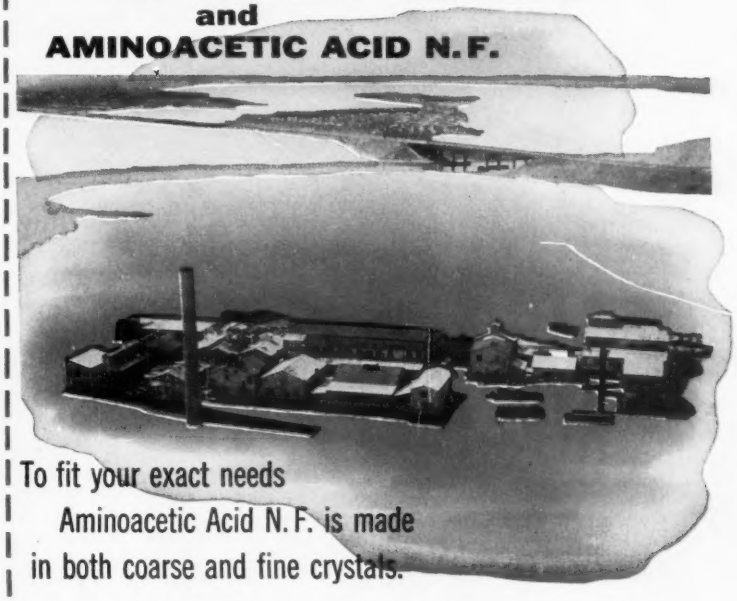

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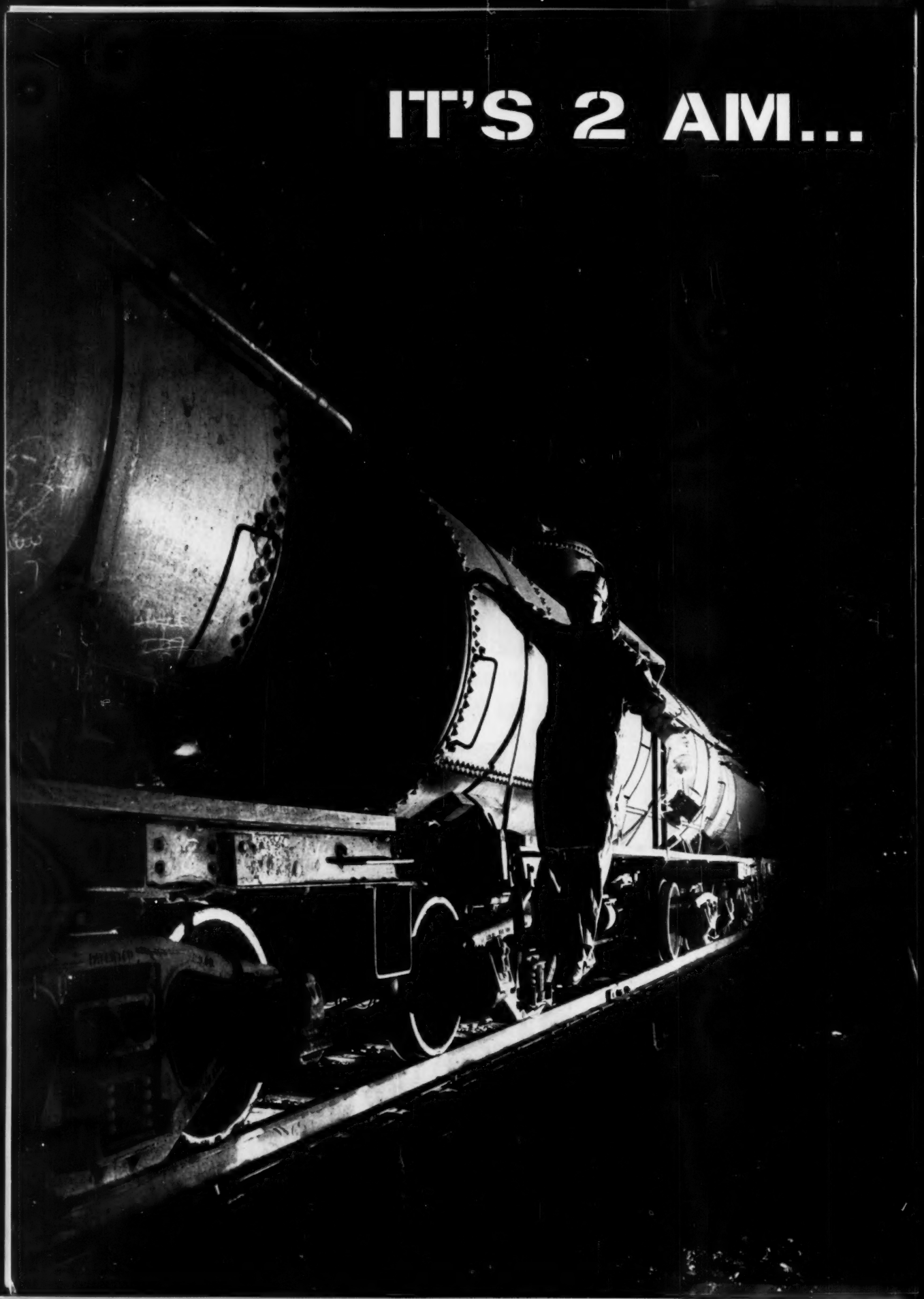
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Corrosion Inhibitors and Bactericides—Primary and secondary amines (Alamines), N-fatty 1, 3-propylene diamines (Diams) and the quaternaries find widespread use as anti-corrosion compounds in crude oil production, transportation and storage. The quaternaries have excellent bactericidal activity, too; find application in secondary oil recovery, circulating water systems.

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**R is a hydrocarbon chain of 7 to 17 carbons.*

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FATTY AMINE ACETATES *Alamacs* $RNH_3^+ CH_3COO^-$ are the water-soluble or dispersible acetic salts of the fatty amines.

FATTY QUATERNARY AMMONIUM COMPOUNDS *Aliquats* $RN(CH_3)_3^+CL^-$ or $R_2N(CH_3)_2^+ CL^-$ contain either one or two fatty alkyl groups.

N-FATTY 1, 3-PROPYLENE DIAMINES *Diams* $RNH(CH_2)_3NH_2$ *Diams* have both a primary and secondary amine group in their structure, therefore are highly polar with strong cationic activity.

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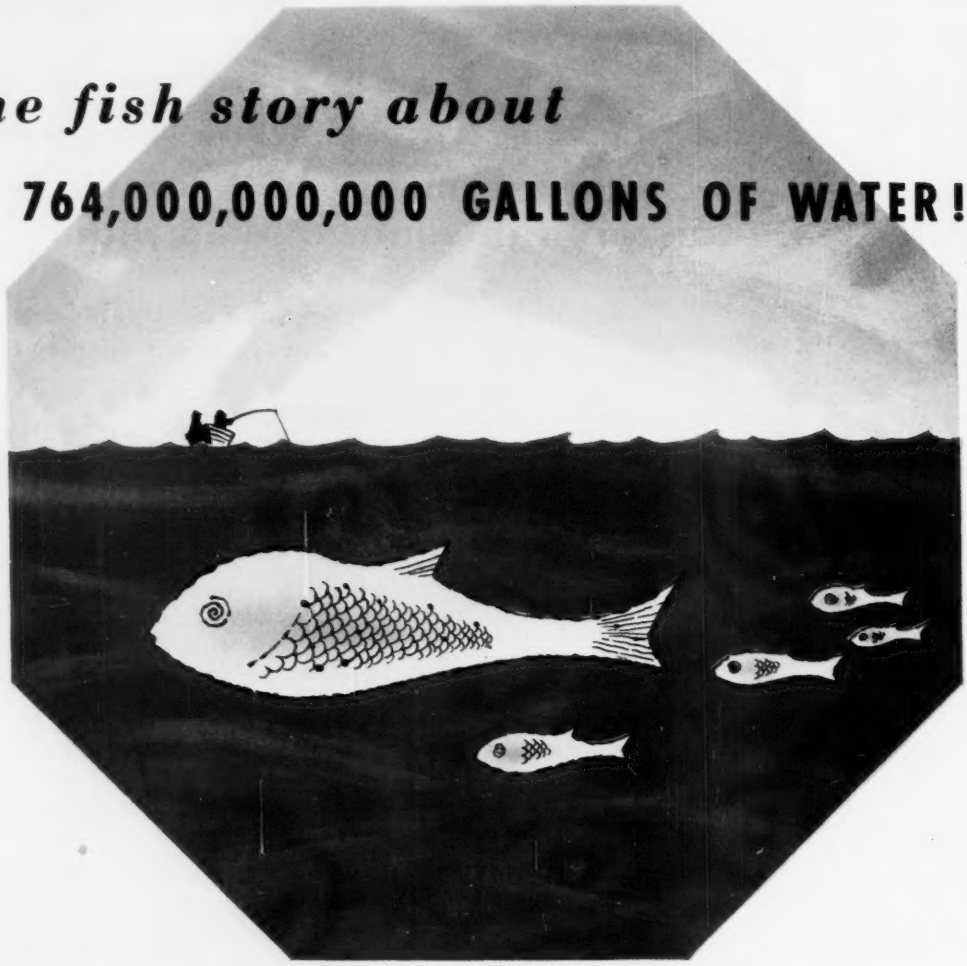

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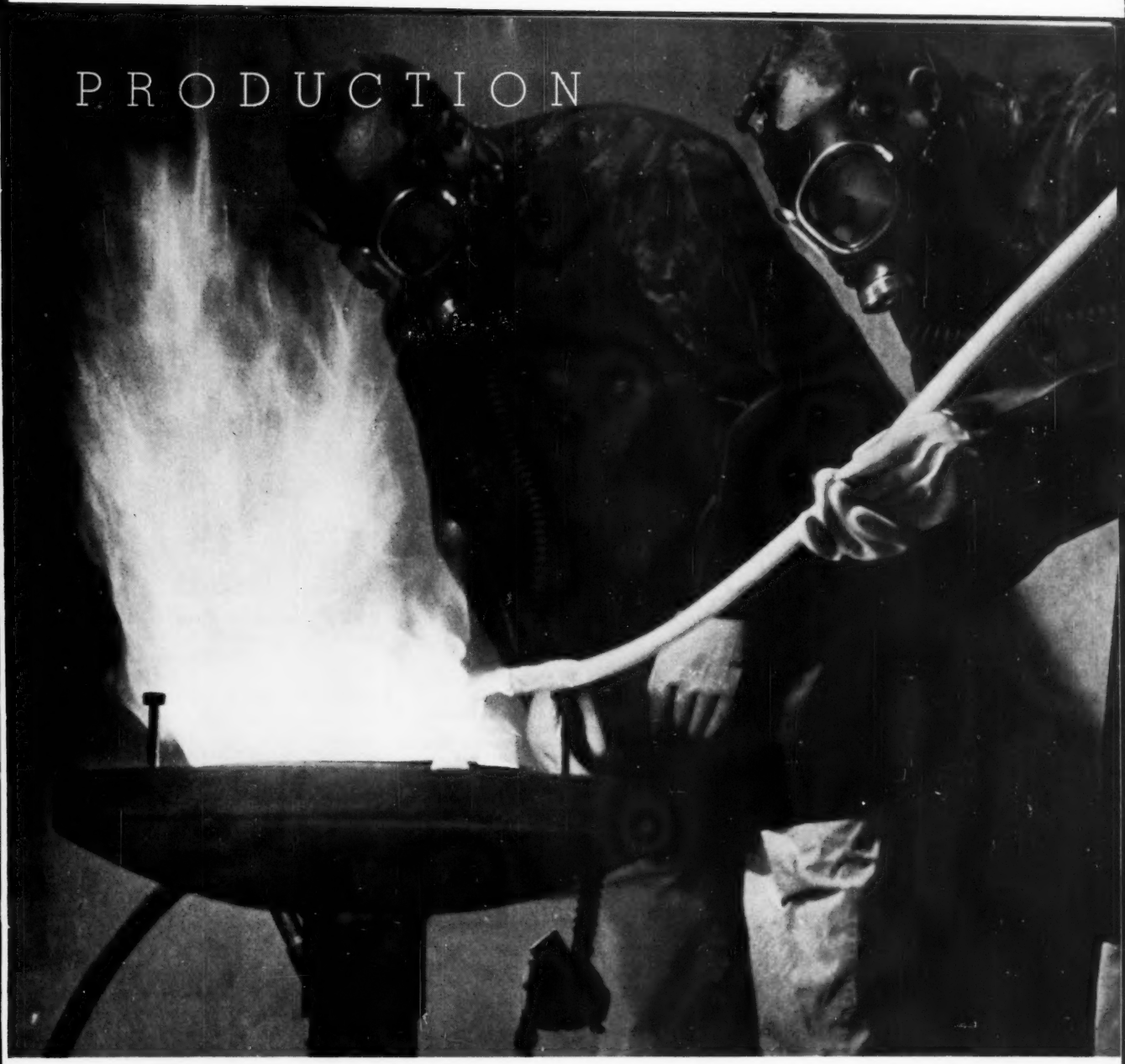

MRI's Buehler, Young give appearance of sorcerers as they hover over experimental fire pot.

Blazing New Trails in Fire Technology

For most people, the setting of fires is a sinister business. But for a group of Kansas City, Mo., engineers this week it's merely part of their normal daily activities — and they're being watched with hearty approval by government and industry.

The engineers are conducting the first major research project at Midwest Research Institute's new fire laboratory — a $55,000, one-year program to develop techniques of combating in-flight and ground fires caused by high-energy boron fuels. The program was contracted for by the Wright Air Development Center (Air Research and Development Command of the U.S. Air Force at Dayton, O.).

Boron-fuel makers such as Olin Mathieson and Callery Chemical and prospective users, e.g., North American Aviation, Marquardt and General Electric, are supplying know-how gathered in their work with the exotic material.

More than Meets the Eye: Aside from showing MRI's pioneering—and eye-catching — work with boron fuels, the program gives industry an insight into the new laboratory's potential for fire protection studies in general. MRI aims to develop techniques of safe handling, storage and transfer of alkyl borane fuel and to establish the fire prevention and engineering programs that will be required by large-scale, commercial boron-fuel manufacturing facilities. The lab is designed, equipped and intended to tackle e very

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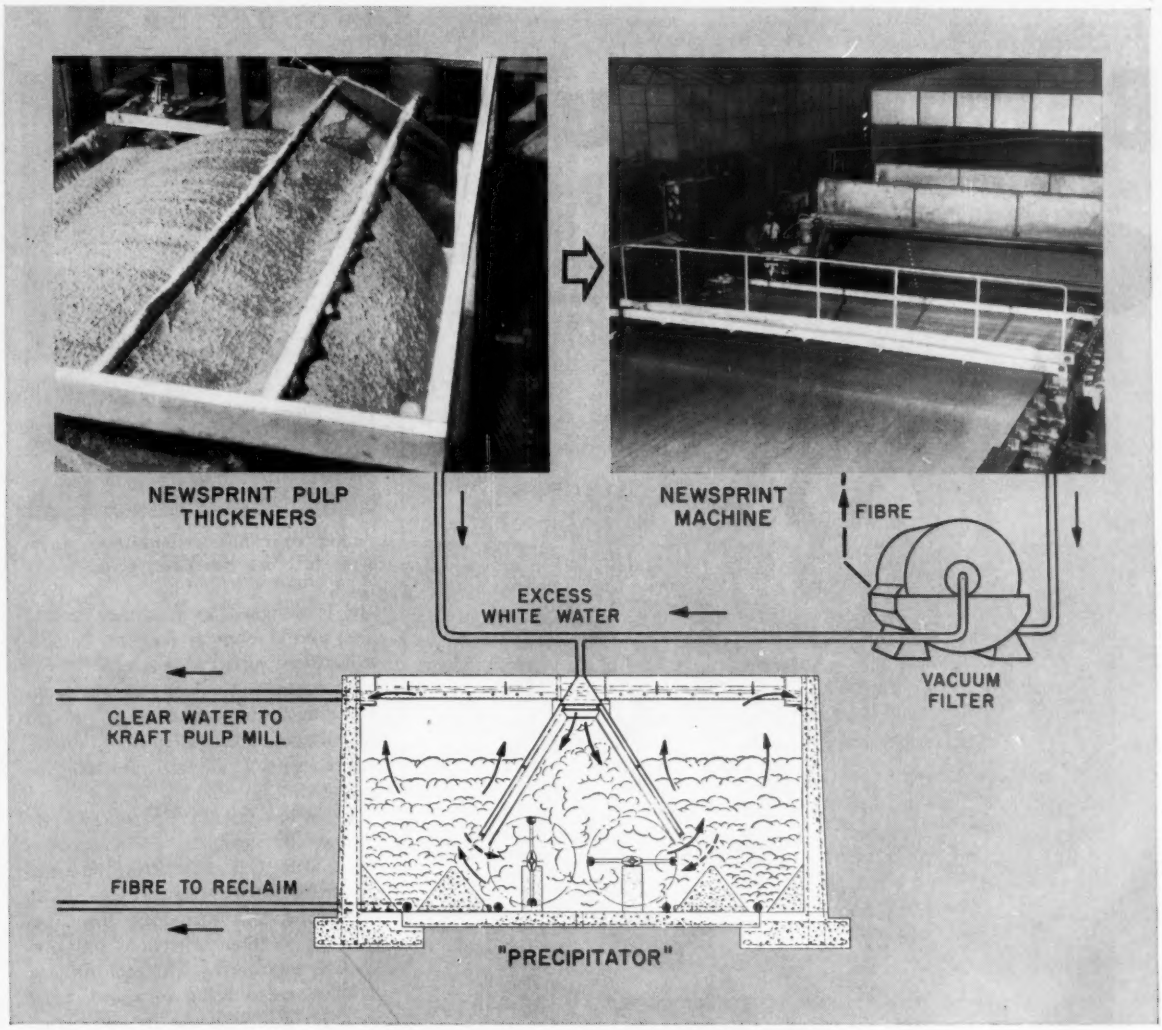
Buehler prepares fire-extinguishing agent for boron-fuel fire test.

conceivable type of fire project, says Buell W. Beadle, manager of MRI's chemistry and chemical engineering division.

"Fire protection engineering could be one of industrial management's most vital tools. But it's a tool that is too little understood and appreciated and too rarely utilized in its broadest most effective sense," says Beadle.

Other Irons in the Fire: Once the boron-fuel program is completed, Beadle says, the lab will be ready to conduct projects such as evaluations of the hazard of new processes and equipment; economics of industrial area group fire protection; development of new and unconventional methods and agents for fire extinguishment; studies in spontaneous ignition, antistatic measures, combustion safety controls and flame-extinguishment mechanism; spray applications of structural fireproofing compounds; studies of problems related to storage, transportation and use of hydrocarbons and other flammables.

Tools of the Trade: To permit especially hazardous and large-scale fire experiments, the lab is isolated on a 42-acre tract about 15 miles south of Kansas City at MRI's Deramus field station. Its heart is an 8-ft cubic test chamber in a prefabricated cement-block building. Test fires are set off in a fire pot in the test chamber. The



Paper mill recovers fibre, saves water, solves disposal problem with the "Precipitator"

Southland Paper Mills at Lufkin, Texas produce newsprint and kraft. They pump general fiber-bearing effluent from the groundwood mills and newsprint savalls to their Permutit *Precipitator* where suspended solids are removed. The clarified effluent is blended with fresh water and used as make-up in the kraft pulp mill. The precipitated fibre is reclaimed and returned to process as No. 1 quality groundwood for the newsprint machines.

The Precipitator offers two big advantages in this type of fibre recovery system:

1. *It is flexible in operation.* The *Precipitator's* principle of diminishing upflow velocity allows far wider latitude in flow rate. Flows as high as 50% over design capacity and as low as 80% below design capacity are often encountered without losing the blanket . . . as compared to constant-cross-section upflow units which depend on uniform flow rate and may lose their blankets with as little as 10% increase of flow over the design rate.

2. *It is expansible.* Units can be placed side to side and end to end. In some cases, drive shafts can be lengthened and a common drive used for a number of units. One mill, for example, started with 15000 gpm and has expanded to 27000 gpm with no loss of space between units.

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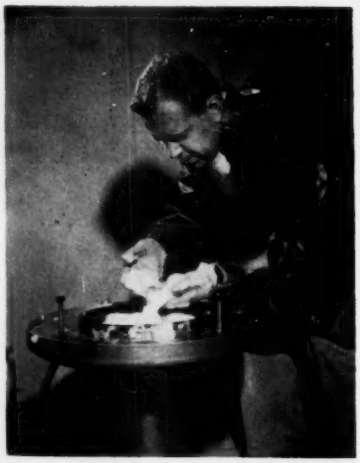


Young examines extinguishing foam after test fire has been doused.

pot is designed so that the burning area and amount of fuel can be controlled and varied as required.

The overhead exhaust system is fitted with a water scrubber to prevent air pollution. The system is also instrumented so that all exit gases may be analyzed.

MRI has beefed up its own resources by teaming, on a contract basis, with U.S. Fire Protection Engineering Services (Kansas City, Mo.), an independent consulting firm specializing in fire protection and prevention engineering. For each project, MRI plans to bring in a task force of specialists with the fire protection know-how to set up and carry out a tailored plan of attack.

For example, for the boron program, key personnel include MRI chemical engineers Hank Young (project supervisor who handled an MRI worldwide U.S. Air Force fire protection survey), Roland Hughes (who was associated with Callery Chemical in the development of HiCal), Bob Buehler (in charge of lab activities) and U.S. Fire's Les Eggleston (senior fire protection engineer).

Here's how they set up the project in four three-month stages:

The first stage — gathering all the background information available on boron fuel's behavior and properties from companies such as OM, Callery and North American; setting up, testing and calibrating the equipment and instruments.

"From this stage, now just about complete," says Young, "we've learned what to expect in the way of vapor

toxicity, effect of the material on the skin. And we're pretty sure that halogenated hydrocarbons such as carbon tetrachloride would be ineffective against boron fires.

The second stage — setting off and extinguishing small fires under controlled conditions. In these fires (1/16-1/2 sq. ft. in area), variables of combustion such as burning area, amount of fuel, rate of burning are studied. Combustion gases and those generated during extinguishment are analyzed, the temperature profile in the test chamber is measured, and the time and amount of extinguishing agent needed are recorded.

"From this stage, now under way," explains Young, "we aim to find out all we can about what boron fire is, what starts it burning and what puts it out. We'll go right down the list of chemicals, starting with the most readily available and promising, throw them on our fires from every angle—as a steady stream, in short bursts, as a spray, etc."

The third stage — careful scaling up the fires, shooting for full-scale, practical demonstrations. MRI will study effects of variables such as humidity, wind velocity, and how much a fire serves as its own heat sink. It also will try to determine the variables' effect on the fire and how to use such information to put the fire out.

Says Young: "There are probably definite correlations between small and large fires. But we don't yet know enough about the variables involved to say for sure what they are."

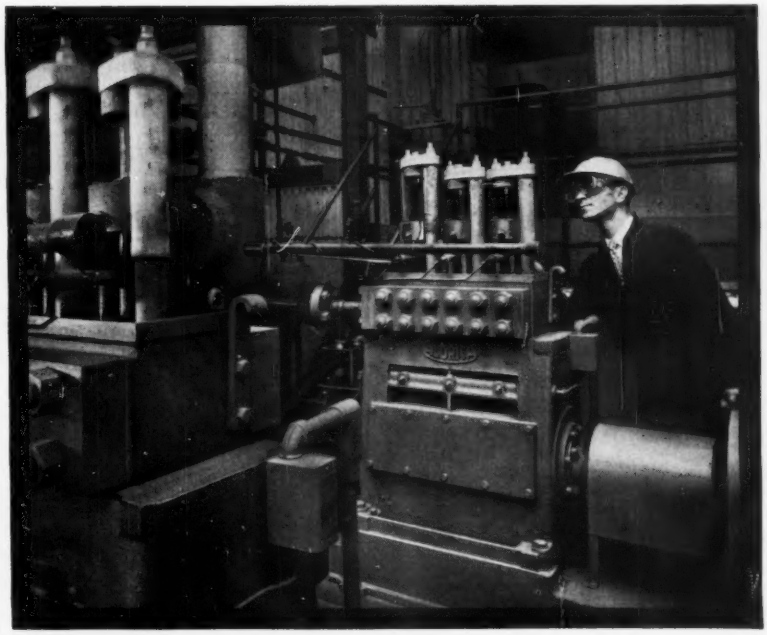
The final stage — fire prevention and protection engineering. In this stage, MRI's specialists will investigate the problems of handling, transporting and storing boron fuel, study and recommend various fire-fighting equipment and systems, devise techniques of reducing fire hazards, such as compartmentation and inerting with gas.

The program is long, complex. But, says Beadle, "industry each year has over a billion dollars worth of property damage and loss of some 12,000 lives from uncontrolled fires. Thus, there must be hard, systematic research into the fundamentals of fire and into engineering techniques that prevent and protect against it." With its boron-fuel program, MRI is showing the chemical industry what such a project involves.

SPENCER CHEMICAL CO. SOLVES PROBLEM:

Maintaining a controlled flow of liquid ammonia at high pressures, 24 hours a day...

At the Vicksburg, Miss. plant of Spencer Chemical Company, ammonia production demands two things of pumps: (1) 24-hour, 7-day-week operation and (2) continuous flow of controlled volumes of liquid ammonia at high pressure.



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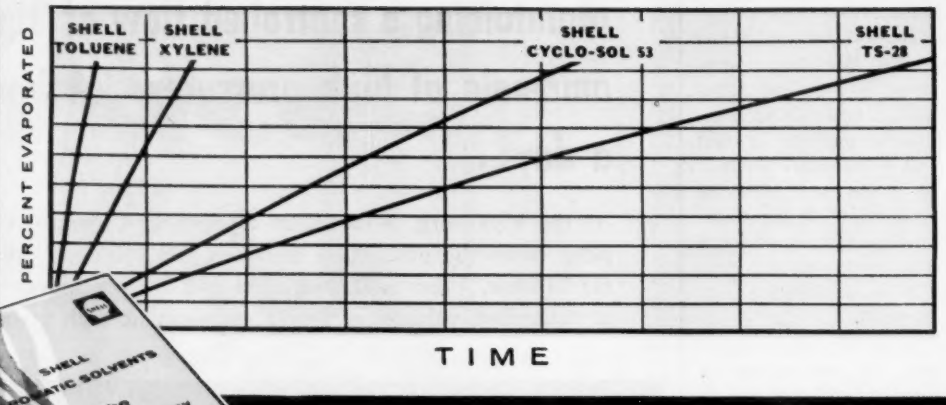

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Technology
Newsletter

CHEMICAL WEEK
November 1, 1958

Use of a nuclear blast to pry oil from Athabaska sands in northern Alberta, Can. (*CW Technology Newsletter, Aug. 30*) is closer. The sands are estimated to hold 300 billion barrels of oil, said to be the world's largest untapped oil reserve.

Approval of the project is now up to the Canadian cabinet, and should be forthcoming unless the experiment is construed as a nuclear weapons test contrary to international agreements signed by Canada. Richfield Oil Corp., which originally interested the Canadian bureau of mines in the idea, has made preliminary investigations.

It's hoped that the blast will thin out the oil sufficiently to cause it to flow out of the sands into the cavity created by the explosion. Another possibility: heat and pressure of the explosion will upgrade the oil as is done in refinery cracking.

•

Research to find better radio-opaque agents for making medical X-ray examinations was reported at a New York Academy of Sciences conference last week. Among the newest hopefuls are polyvalent metallic chelates such as bismuth diethylenetriaminetetra-acetate; soluble cesium salts; and colloids (e.g., dispersions of iodinated, phosphonated, and sulfonated polydivinylbenzene).

•

Superiority of alkylolamide-type detergents over presently used nonionic, ethylene oxide types for scouring raw wool has been demonstrated in new studies by the U.S. Dept. of Agriculture. Chemist Willie Fong, of USDA's Western Utilization Research and Development Division (Albany, Calif.), finds that alkylolamides don't damage wool fiber, permit "virtually complete" removal of wool grease (crude lanolin) from scouring wastes. Only 60% of the grease is removed by similar treatment—cooling and acidifying—of scouring wastes containing conventional ethylene oxide detergents. More complete removal would reduce stream pollution by scouring wastes.

Best of the various types of alkylolamides tested are those derived from lauric acid and diethanolamine, particularly those containing a high proportion of dihydroxyethyllauramide.

•

Why doesn't water compress like air? What makes it freeze or boil only at certain temperatures? Explicit answers will be sought for such fundamental questions in a new $98,000 research project at Stanford University. The project to investigate "the structure of liquids" is largely supported by the Air Force and Navy, with The Research Corp., The Fluor Corp., California Research Corp., and General Petroleum Corp. also contributing a total of $5,000.

Technology

Newsletter

(Continued)

Fibrous potassium titanate, a new high-temperature insulator developed by Du Pont's Pigments Dept., is claimed to be about twice as effective on a volume basis as any other known insulating material in the 1300-2100 F range. Secret of its success is the small diameter (less than 1/25,000 in.) and high reflectance of the fibers, which block heat penetration by scattering incoming infrared rays.

Likely uses for the new insulator (now produced on a semiworks scale at Du Pont's Newport, Del., plant) are in rockets, missiles, etc.—where space and weight are critical. But it may find applications in electrical and acoustical insulation, reflective shielding for heating units and ovens, gaskets and packing, filters and other nonmilitary products.

•

A new two-stage process for making granular rutile from ilmenite (titanium dioxide) is under study at the Commonwealth Scientific and Industrial Research Organization (Melbourne, Australia). First stage of the process is reaction of ilmenite with sulfur vapor at 700-850 C and hydrothermal oxidation of the product in an autoclave at 100-140 C. In the second stage, iron compounds are removed, leaving skeletal aggregates of substantially pure titanium dioxide. Elemental sulfur is recovered. New methods of separating contaminants other than iron from the rutile are under development.

•

A technique of producing extremely high vacuum with low power was disclosed last week at a meeting of the American Vacuum Society in San Francisco. Bruce Bailey, of Arthur D. Little, Inc., said cryopumping, as the system is called, can produce extremely low pressures—about one-billionth of an atmosphere—economically enough for large-scale industrial applications.

In essence, the cryopump is an ultralow-temperature refrigerator, using helium gas as the refrigerant. It is most efficiently used in conjunction with a mechanical pump. Reason: the pumping rate of a mechanical system falls off rapidly as vacuum increases, but the cryopumping rate actually increases at higher vacuums. By teaming the advantages of both methods, said Bailey, a combined system can produce ultrahigh vacuums in less than a fifth of the space, with less than one-tenth the power required by the most efficient conventional system. Cost of capital equipment is also expected to be considerably less.

First large-scale installation of cryopumping is in a hypersonic wind tunnel at the University of Southern California. Only moving parts in the system are in the refrigerator, which is powered by a 50-hp. motor. A comparable system using a gaseous diffusion pump would require 500,000 hp.

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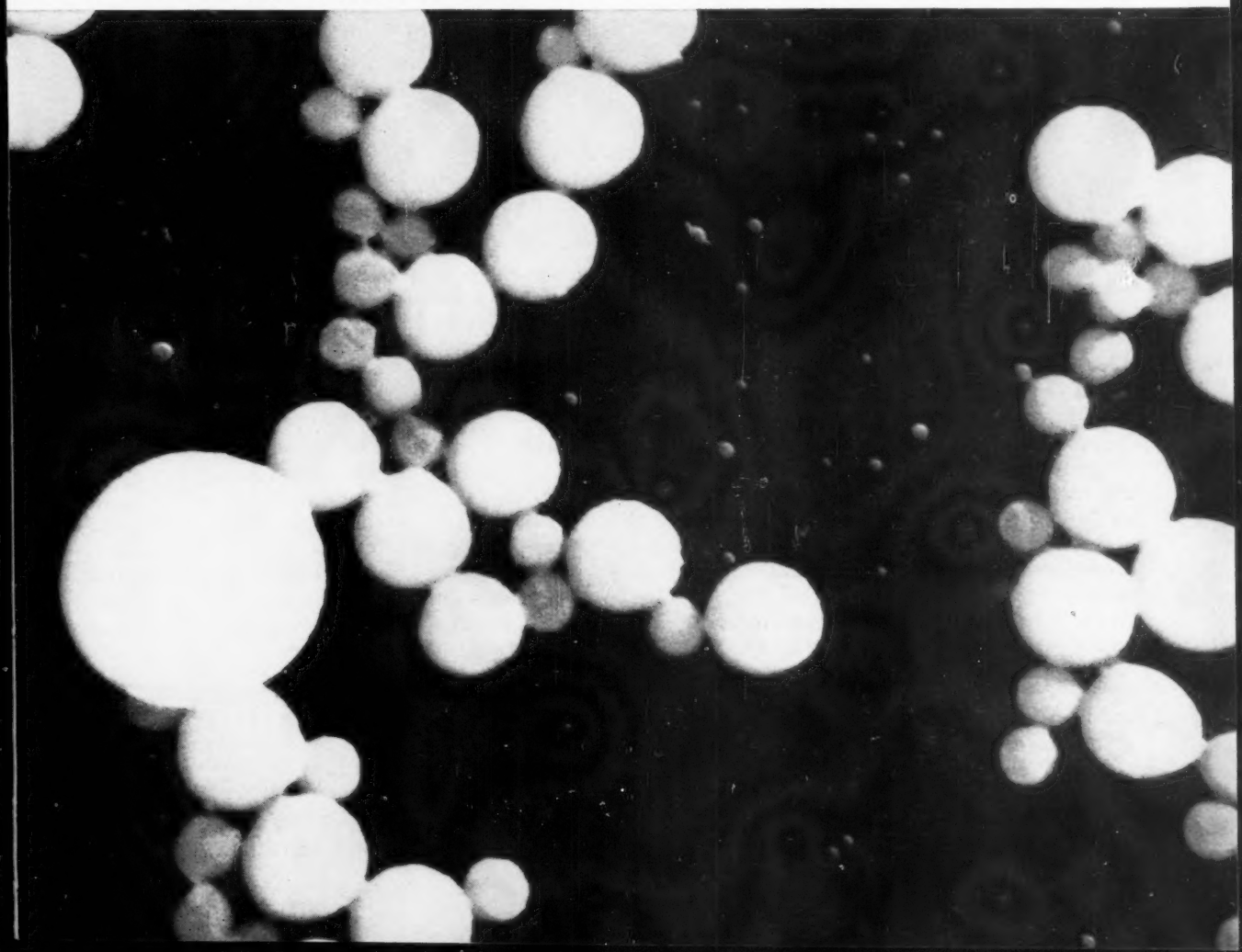
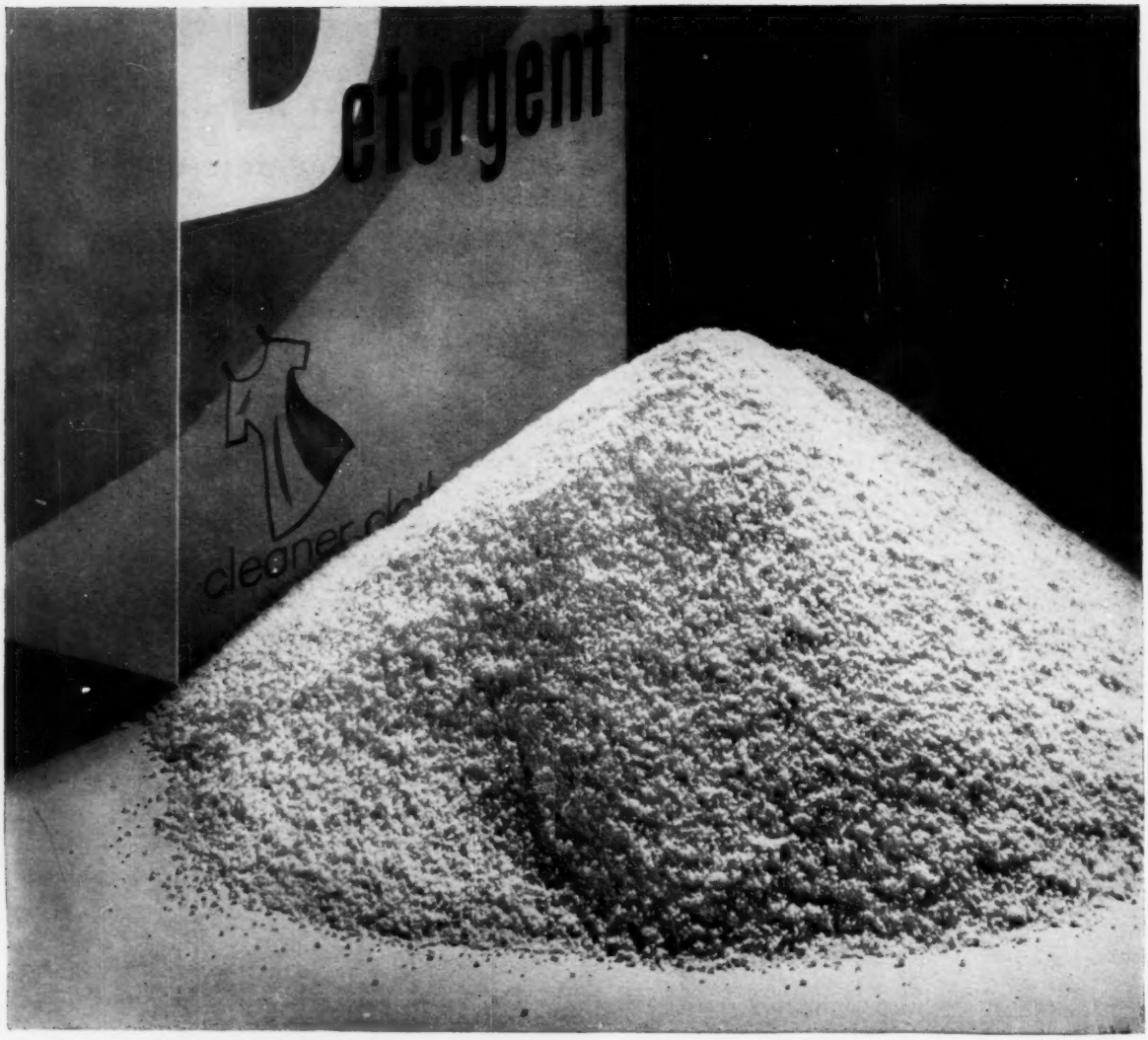
Electron micrograph of polyvinyl acetate emulsion





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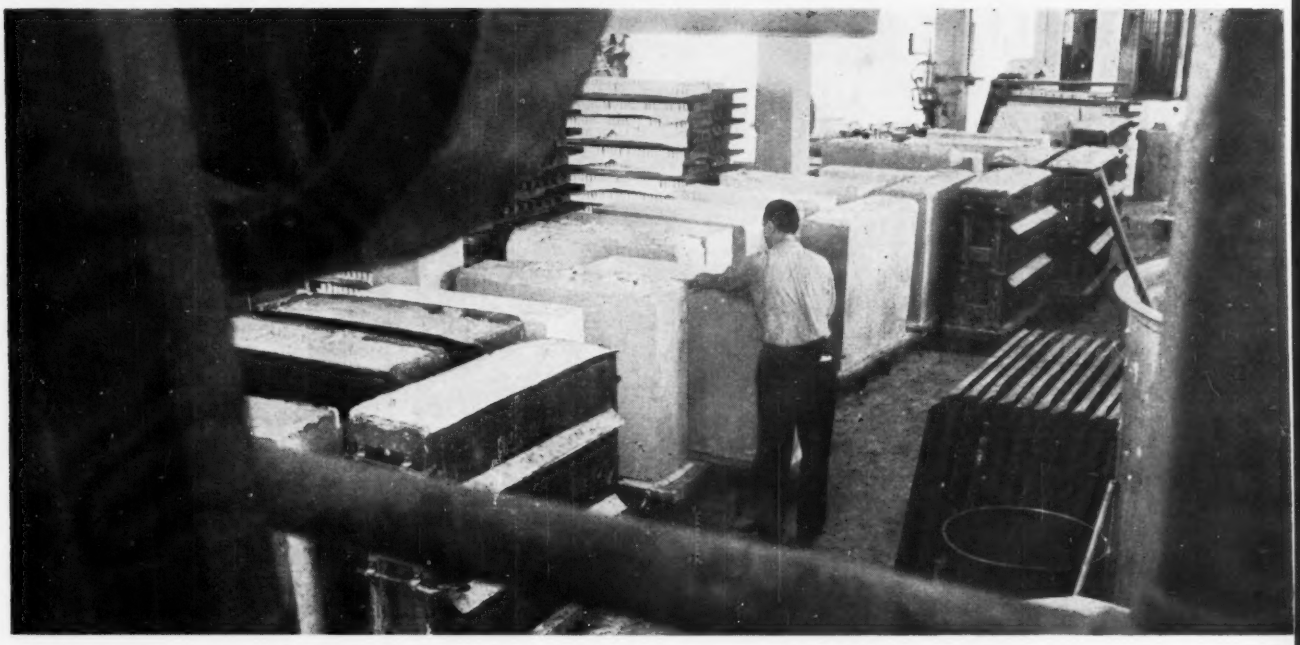


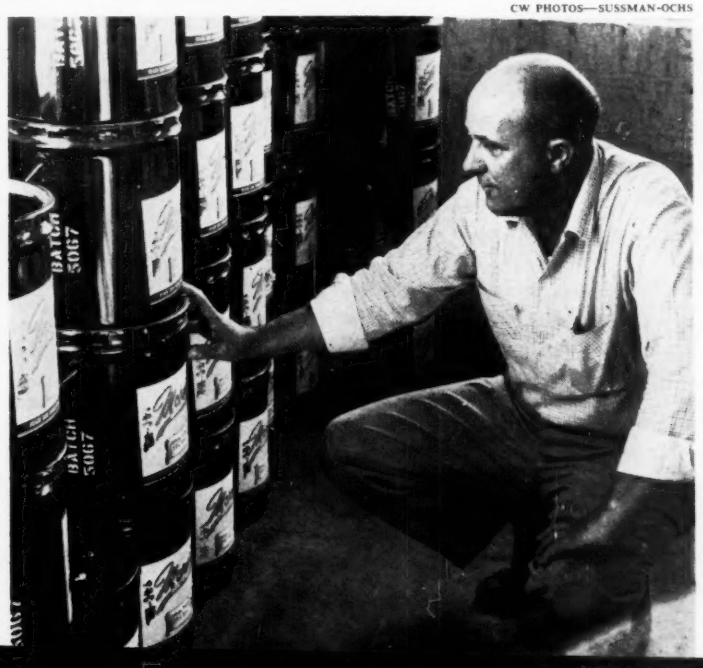
Captive production entails soap bar manufacture behind bars of Maryland House of Correction.

Prisions: $4.5 Million Specialties Producers

Work has just started in Lansing, Kan., on a new, 250,000-gal./year paint plant, due in operation next July. Most striking features of the new plant: it's behind prison walls and will be prisoner-operated. Seven states have similar paint plants, and 18 have soap plants—all part of the prison industry system that turns out at least $90 million worth of goods each year.

According to the most recent government survey of prison industries (both state and federal), the specialties share is about 5% of this total, with paints highest in value ($2.3 million), closely followed by soaps ($1.8 million). *CW*'s own check of specialties work in the penal institutions of the 48 states shows that 20 states are turning out chemical specialties (federal prisons make none), and assign about 850 men to these tasks.

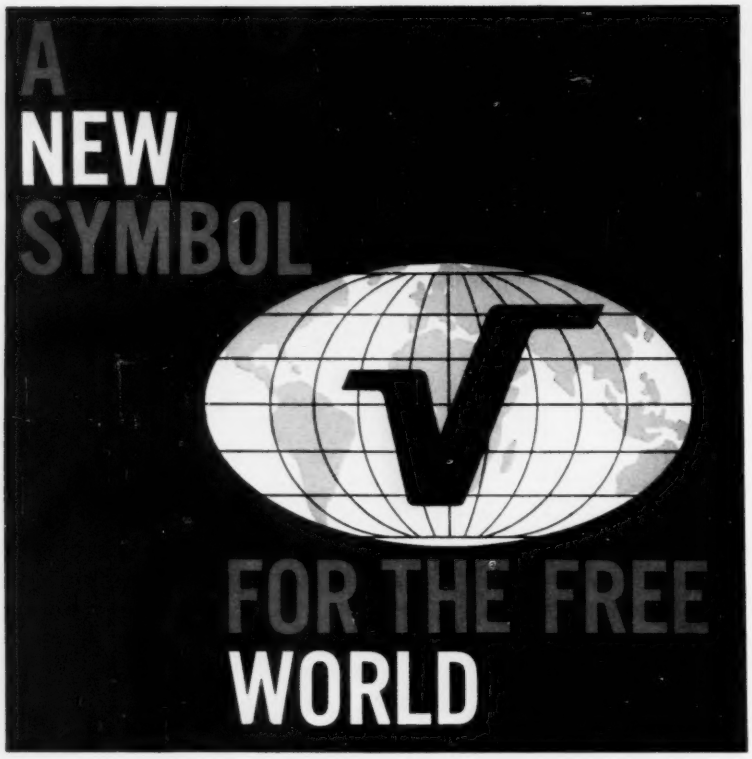
CW PHOTOS—SUSSMAN-OCHS



C. H. Puno, superintendent of Maryland House of Correction, inspects prison's soap output.

Soap Bars: The most popular prison specialty products—though not highest in value—are soaps, detergents and related cleaning compounds. Last year 18 state prisons turned out 15 million lbs. of these materials, with an estimated sales value of $1.8 million. In prison soap making, diversification is the rule—most states make at least 15 different items; two, Iowa and West Virginia, turn out 33 different kinds.

Paint-making in prisons rates second to soaps, is the top dollar-volume producer. The seven states in this type of enterprise turned out over 800,000 gal. Estimated value, at average price of $3/gal., is $2.3 million. After paint and soap products, most-often-made prison products are insecticides, waxes, polishes, disinfectants and cosmetics. Most states



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- Aircraft components and ordnance systems
- Ceramic colors, pigments, and chemicals

SPECIALTIES

don't break down production and sales figures on these items largely because the bulk of the output is used by the prisons themselves.

None of the prison-made chemical products are sold in retail outlets. With the exception of North Carolina, no state, by law, can sell them on the open market even if there is a surplus. And even in North Carolina, say prison officials, no specialties have ever been sold on the open market.

In virtually all states, production is geared directly to sales; products aren't turned out until the order is in the hands of prison officials.

All state prisons making specialties are required by law to sell only to city, state and tax-supported institutions (e.g., hospitals, schools, orphanages, municipal buildings). And only Louisiana, Maryland and Wisconsin allow interstate sale of specialty items, providing (1) that the sale is made to a tax-supported institution and (2) that the other state has no objection.

How They Sell: Most prisons selling specialties to state agencies submit bids to their state purchasing departments. If the state doesn't require that tax-supported institutions buy prison products, these bids are considered with those of private industry. Now, more than half the states* that make specialties have mandatory state-use laws.

Although Florida and New Jersey both have mandatory state use of prison production, the laws aren't rigidly enforced. In New Jersey, some state-operated institutions aren't required to buy prison goods—schools, for example—but other state agencies, such as county jails, are. And in Florida, state agencies that don't want to buy prison specialties can appeal to the state's governing board.

Prisons package their own items, buy raw materials through state purchasing departments, distribute their output in both their own and commercial vehicles. All prison-made specialties must carry some sort of labeling indicating their origin. In North Carolina, prison specialties have the brand-name Tarstin—Tar Heel State Industries—and in New Jersey, products are labeled Sudia—for State Use Division, Institutions and Agencies.

Prison Pay: Almost all inmates are paid a small wage for their labor—

*Illinois, Indiana, Louisiana, Iowa, Kansas, Maryland, Missouri, New Jersey, Ohio, Tennessee, West Virginia, Florida.

PRISON-MADE CHEMICAL SPECIALTIES (1958)

LOCATION	PRODUCT	SALES	PRODUCTION
California			
San Quentin (15)†	Detergent	$200,000	2 million lbs.
Colorado			
Canon City (12)	Soaps		133,176 lbs.
	Detergents	$23,200	76,379 lbs.
	Disinfectants, insecticides, flavors, cosmetics	$1,600	(not available)
Florida			
Sneads (8)	Soaps, detergents, insecticides, disinfectants	$60,000	(not available)
Georgia			
Reidsville	Soaps, insecticides	(no outside sales)	
Illinois			
Joliet (90)	Soaps	$385,471	2 million lbs.
	Disinfectants	$16,359	12,240 gal.
	Insecticides	$72,086	45,920 gal.
Menard (3)	Wax	$18,242	12,500 gal.
Indiana			
Michigan City (55)	Soap chips		486,000 lbs.
	Shaving soap		4,450 lbs.
	Toilet, other bar soaps		4,262 cases
	Liquid soap	$129,655	1,500 gal.
Pendleton (60)	Paint	$375,000*	125,000 gal.
Iowa			
Anamosa (32)	Soap products	$33,000*	300,000 lbs.
	Disinfectants, insecticides, wax	(not available)	(not available)
Kansas			
Lansing (23)	Soaps, detergents, disinfectants	$60,000	600,000 lbs.*
Kentucky			
LaGrange (45)	Soap	$44,000	387,331 lbs.
	Wax	$653	435 gal.
Louisiana			
Angola (25)	Soap, detergents waxes, disinfectants	$21,309	(not available)
Maryland			
Jessup (100)	Soap, detergents	$70,000	520,000 lbs.
	Paint	$220,000	100,000 gal.
	Waxes	$15,000	30,000 lbs.
Michigan			
Ionia (14)	Soaps	$122,400	1.2 million lbs.*
Missouri			
Jefferson City	Soap, detergents,	$120,000	1.2 million lbs.*
North Carolina			
Raleigh (46)	Paint	$550,000*	200,000 gal.
	Soap	$200,000	2 million lbs.*
	Disinfectants, insecticides, waxes	(not available)	(not available)

†Figures in parentheses indicate number of workers (inmates) involved. *Estimate.

Continued on p. 70

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Continued from p. 69

New Jersey			
Bordentown (43)†	Soap products, Disinfectants, insecticides, cleaning products, etc.	$100,000*	1,087,693 lbs.
		$50,000*	23,570 gal.
Ohio			
London (68)	Soap, disinfectants, insecticides, polishes, waxes	$227,000	2.3 million lbs.
Oklahoma			
McAlester (15)	Paint	$24,000*	5,000-10,000 gal.
	Soap	$1,750*	20,000 lbs.
Tennessee			
Nashville (125)	Paint	$890,000*	350,000 gal.
	Soap	$50,000	Over 500,000 lbs.
	Disinfectants, insecticides	(not available)	(not available)
West Virginia			
Moundsville (66)	Paint	$75,484	25,000 gal.*
	Soap, wax	$52,254	(not available)
Wisconsin			
Waupun (12)	Paint	$76,731	27,989 gal.

†Figures in parentheses indicate number of workers (inmates) involved.
* CW estimate.

Specialties Turned Out by Joliet, Ill., Inmates

PRODUCT	PRODUCTION	SALES VOLUME
Soap flakes	500,000 lbs.	$51,250
Granulated flakes	541,750 lbs.	$63,168
Yellow laundry soap	5,400 gross	$33,480
White floating soap	3,200 gross	$27,200
Laundry builder	573,325 lbs.	$30,673
Dishwashing compound	290,644 lbs.	$29,741
Scouring powder	83,784 lbs.	$7,484
Soap powder	161,408 lbs.	$6,951
Mechanics hand soap	1,500 lbs.	$175
Plastic destainer	1,500 lbs.	$150
White milled soap	3,335 gross	$35,000
Coco palm soap	1,540 gross	$15,400
Tar soap	240 gross	$2,268
Germicidal soap	780 gross	$7,683
Hand pumice soap	35 gross	$331
Shaving soap	350 gross	$1,803
Soft soap paste	6,600 lbs.	$1,050
Liquid sanitizer	24,550 gal.	$36,825
Liquid floor cleaner	60,000 gal.	$60,000
Pine oil disinfectant	21,370 gal.	$35,261
Liquid soap	9,200 gal.	$8,740
Coconut oil shampoo	1,100 gal.	$1,925
Insecticide, lethane	1,440 gal.	$1,224
Insecticide, mill spray	5,200 gal.	$9,880
Insecticide, 2% Chlordane	2,500 gal.	$2,000
Insecticide, with DDT and Chlordane	3,100 gal.	$3,255
	Total in 1957	$472,917

average compensation is 34¢/day.

Year-to-year checks show that the quantity of specialties produced by prisoners does not fluctuate. For example, E. M. Haight, manager of Michigan Prison Industries, says: "Current value of products made in our soap plant is $110,000, and this has been . . . steady for the past 20 years."

State vs. Private: A big problem facing the prison industries program is criticism from private industry. For years, printers, shoemakers, canners and foundrymen have raised this issue: "Should state-made products be pitted against private industry?"

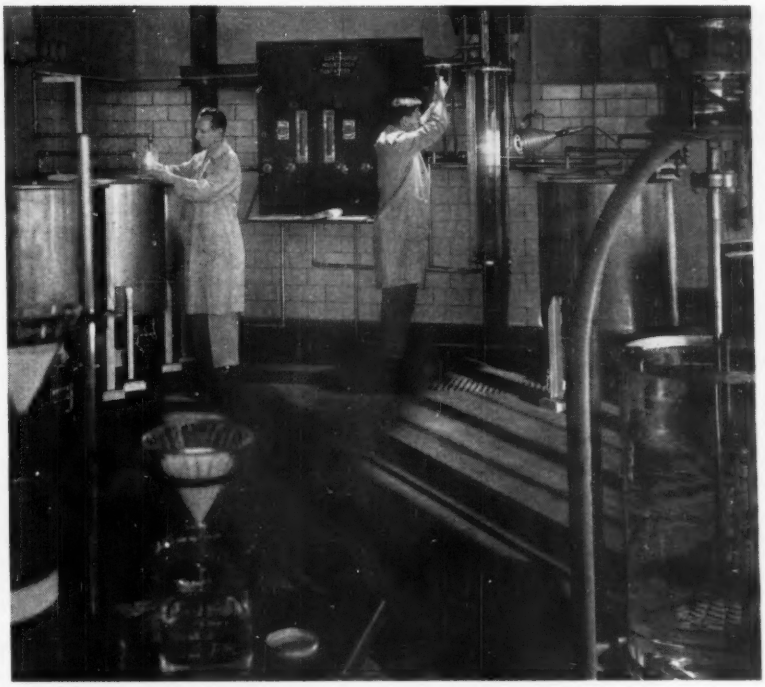
Right now, sanitary supply makers are probably complaining most bitterly about prison-made specialties. They say that tax-supported institutions do, or could, buy about 20% of the prisons' output. When the bulk of a chemical company's sales are to tax-supported institutions the competitive problem caused by prison industry is serious for that firm.

Drop in the Bucket: The other side of this issue is stated just as strongly by prison managers. Michigan's Haight says: "It's generally realized that prisoners must be employed or they will be a menace to society when they are released."

Warden John Burke, Wisconsin State Prison, says, "A study showed that the output of one specialty item in our prison was 0.0000000000001% of the total U.S. production of that chemical.

A study of the entire soap, detergent and paint field in the U.S. supports that statement, indicates that prison-made specialties scarcely make a dent in over-all specialties production. Prison-made soap products, for example, accounted for less than 0.32% of the total 4.874-billion-lbs. production of soap and detergent products last year. Sales comparison of prison-made and private-industry paint looks much the same—about 0.14% of the $1.6 billion (manufacturer's level) in paint sales.

Prison-made specialties will likely always be regarded as a threat to some industry, although the seriousness of this threat is debatable. Most specialties makers unquestionably consider their rivals in private enterprise far more pressing competition, and are little concerned with behind-bars industry.



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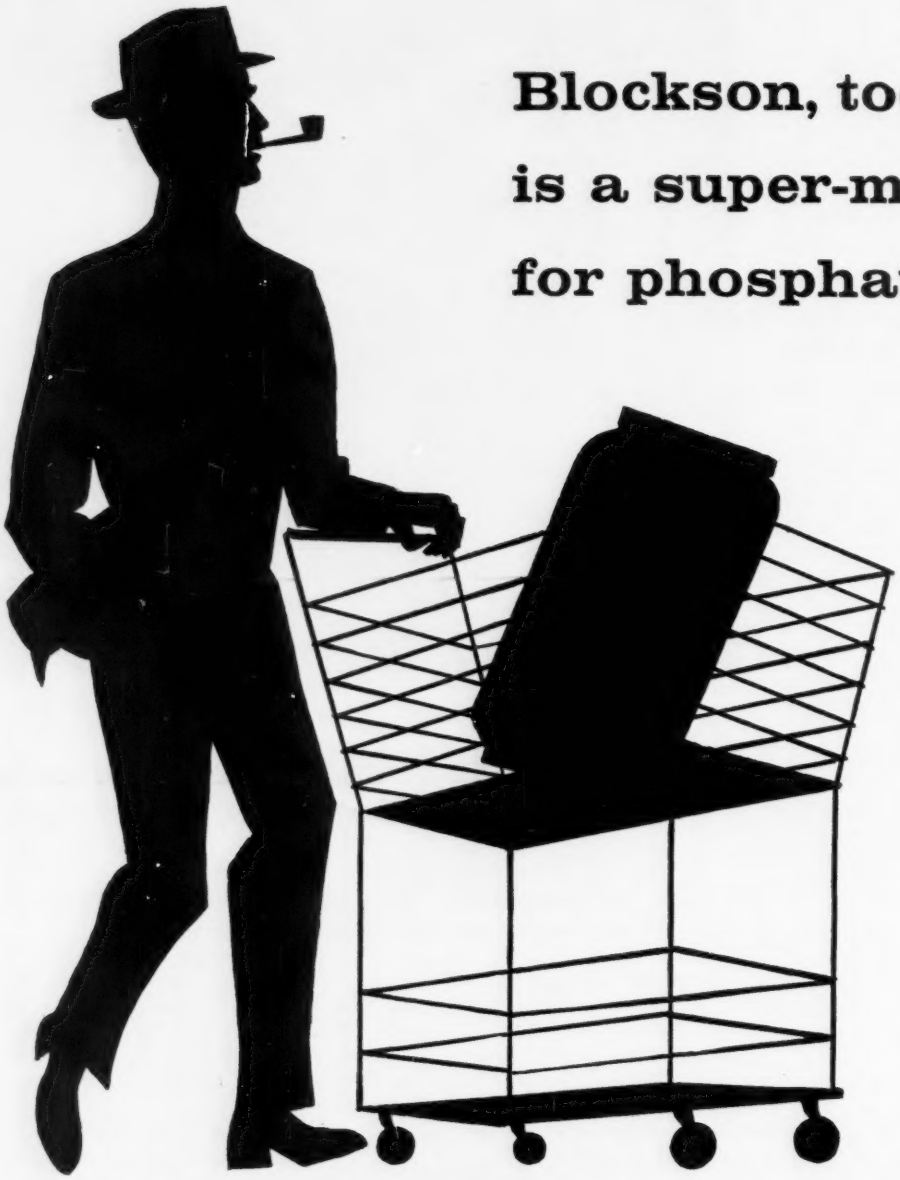

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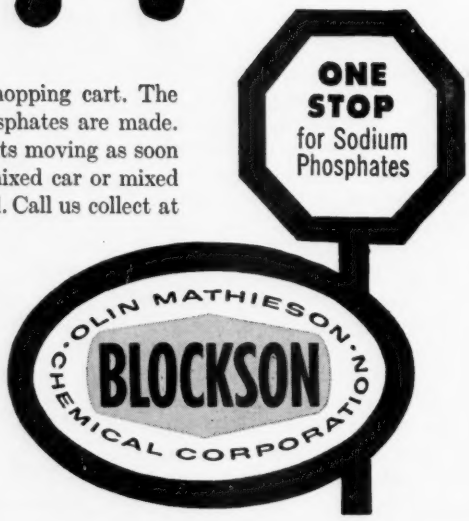

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Market Newsletter

CHEMICAL WEEK
November 1, 1958

The West Coast anhydrous ammonia market is still in an uproar over major maker Shell Chemical's drastic 25% cut in its prices of the fertilizer ingredient. New price: $66/ton—down $22.

The action follows closely Best Fertilizer's announced intention to beat the '59-'60 off-season slack by posting a $63/ton tag f.o.b. at the firm's now-building Lathrop, Calif., plant. Best's on-season '60 price (January-July) will be $68/ton.

The Best announcement apparently caused customers to hesitate in signing new contracts, cut deeply into Shell's prospect list. Says Shell frankly: "We cut our ammonia price to avoid further loss of current and prospective business." The company, with a total annual capacity of 180,000 tons, is the biggest ammonia producer in the West; it reportedly has about 20% of the total U.S. nitrogen market.

Reaction of other Western producers to the Shell move: much grumbling—but they're going along with the lower schedule. It's a good indication that ammonia overcapacity is still a serious problem in the West.

•

New light this week on the U.S. fumaric acid picture: scratch Bzura Chemical's proposed Puerto Rico plant as a future source (*CW Market Newsletter, Oct. 25*).

It's speculated that equipment now being assembled at the firm's Keyport, N.J., location for shipment to Puerto Rico or to some other Caribbean site could be used there for citric production, but President Hyman Bzura hasn't confirmed this.

•

U.S. automotive grease consumption will skid 46% in 10 years, predicts Esso Standard's manager of marketing economics, W. M. Drout, Jr. This week he told the National Lubricating Grease Institute meeting in Chicago that consumption will decline from 197.3 million lbs. in '56 to 107.2 million lbs. in '65. In this period, passenger-car grease consumption alone will drop 67%—from 120.2 to 39.8 million lbs.

Passenger car and truck registrations will, of course, increase, but a declining number of chassis grease fittings per vehicle and longer intervals between greasings will more than offset registration gains.

There's one indication that Drout's forecast is conservative, at least in one respect. He estimates that the interval between greasings will climb from the current 2,200 miles to about 2,700 miles by '65. (Ford is advertising that its new cars need greasing only every 4,000 miles.)

•

"Is plastics' bullish market coming to its end?" Bakelite's G. L. Pitzer last week posed the question to the Drug, Chemical and Allied

Trades Committee in New York and answered it himself: "I for one certainly do not believe that the plastics plateau is here. . ."

Despite his optimistic outlook, Pitzer's supply/demand scorecard for the plastics industry emphasized overcapacity in all quarters:

- Polyethylene: sales of 750 million lbs. in '58; announced capacity, about 1,300 million lbs.
- Vinyl resin: sales of 730 million lbs., 200 million under capacity.
- Polystyrene: sales of 625 million lbs. for '58; capacity is 850 million lbs.
- Phenolics: sales leveled off at 425 million lbs.; capacity is estimated at 700 million lbs.
- Epoxy: 35 million lbs. being sold; estimated capacity is 75 million lbs.

The hula hoop is "high-density polyethylene's one large-volume penetration . . . one that came out of the blue and has consumed substantial poundage . . ." Pitzer noted during his talk. While in agreement with other industry observers that the hoop provided an unexpected—and much needed—break for producers (*CW, Oct. 11, p. 117*), Pitzer cautioned against building market programing on such "surprise" end-uses.

•

Polyethylene's position in plastic pipe markets is strengthened through Allied Chemical's development of a new extrusion technique that permits fabrication of large-diameter pipe from high-density polyethylene. Heretofore, polyethylene has been limited to fabrication of smaller-diameter pipes (*CW, Aug. 9, p. 77*). Larger ones were made from other plastics—notably styrene-acrylonitrile copolymer.

Allied makes no pipe; it developed the extrusion technique to boost sales of its A-C Polyethylene Pipe Compound (made by Semet-Solvay Petrochemical) and to enable the firm to compete in a field previously held largely by metals, ceramics and fibers.

SELECTED PRICE CHANGES — WEEK ENDING OCTOBER 27, 1958

	Change	New Price
UP		
Copper chloride, cuprous, dms. wks., lb.	$0.0105	$0.3855
COPPER OXIDE, RED, 97% USN		
Type I, 100-5,000-lb. lots, lb.	0.015	0.43
Copper sulfate tribasic, distributors, bgs., c.l., cwt.	0.75	26.40
DOWN		
Castor oil, imp., No. 1, Brazilian, tanks	$0.0025	$0.1575
Mercury metal, 76-lb., flask, net flask	1.00	232.00
Platinum metal, works, oz.	0.50	54.00

All prices per pound unless quantity quoted

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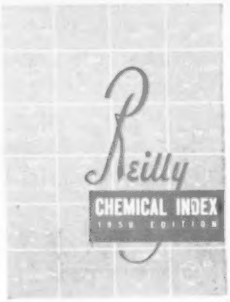

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Diving Exports Nip U.S. Glycol Output

With winter on the way, U.S. antifreeze marketers are this week putting their promotion campaigns into high gear. Domestic demand, by all estimates, looks good, but exports are off, and suppliers of the basic ethylene glycol figure '58's output won't be more than 1.175 million lbs.—about 24 million less than in '57.

But the 2% production slump is not disturbing most producers. Reasons: antifreeze use—the main outlet—is greater than ever; the production decline primarily reflects a more "normal" export demand after the big, "temporary" surge in '57.

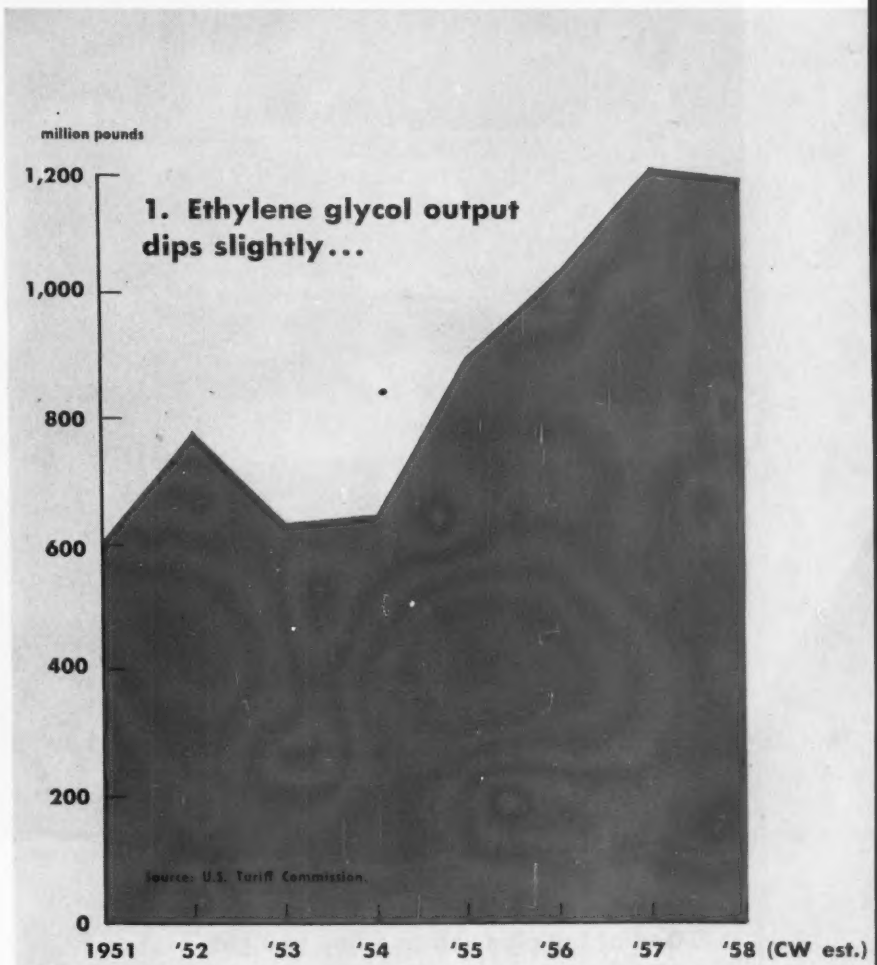
Underscoring their confidence in continued increases in glycol demand are a host of capacity boosts, recently completed or soon to come in:

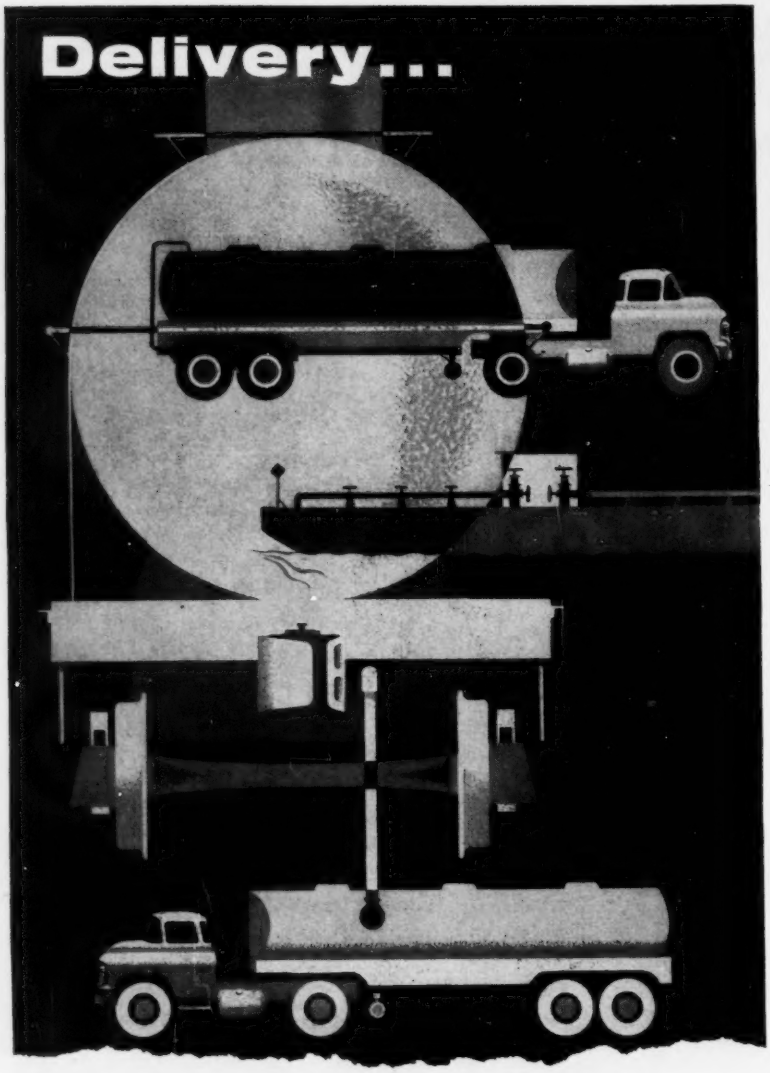
- Dow will have over 350-million-lbs./year capacity when expansion now in the works is completed at Plaquemine, La.
- Jefferson Chemical's current expansion and process streamlining, at Port Neches, Tex., will boost the firm's capacity to 180 million lbs. by early next January.
- Calcasieu Chemical Corp., newcomer in the glycol market, made first shipments in late September from a spanking-new 75-million-lbs./year installation at Lake Charles, La.
- General Aniline & Film went onstream earlier this year with a 35-million-lbs./year unit at Linden, N.J.
- Wyandotte's expanded capacity at Geismar, La., is now some 90 million lbs./year.

When all expansions are complete, U.S. ethylene glycol capacity will be about 1.7 billion lbs.

Export Dilemma: Overseas glycol shipments during the first seven months of this year were erratic, ranging from 263,000 lbs. to nearly 7 million lbs./month. But despite this fluctuation, total exports might be figured at 75 million lbs. this year. This is second to and about 45% less than the high mark of 137 million lbs. exported in '57.

Most U.S. market followers cannot fully explain last year's abnormally high glycol exports. But best guesses are that much of it was transhipped into Communist countries (*CW, Sept.*





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COAL CHEMICALS

U.S. Ethylene Glycol Capacity by '59

(million pounds, estimated)

Allied Chemical	35
Calcasieu Chemical	75
Dow Chemical	350
Du Pont	150
General Aniline & Film	35
Jefferson Chemical	180
Olin Mathieson Chemical	100
Union Carbide Chemicals	750
Wyandotte Chemicals	90

14, '57, p. 93). Trade observers who favor this explanation point out that somewhat increased glycol output in western Europe and in the Communist-bloc countries tallies with the sudden export drop in '58. Nonetheless, glycol exports will likely continue at a substantial rate for several years.

Antifreeze Swell: Accelerating the brisk domestic glycol demand is its use as engine antifreeze. About 880 million lbs.—a 75% chunk of total U.S. output—will be used this year. That's 60 million lbs. more than was used in '57, 100 million lbs. more than in '56.

Antifreeze retailers, backed by glycol producers, are pushing hard to swing motorists to use of "permanent" glycol. The campaigns have been effective, judging from steadily declining methanol antifreeze sales, a decline that's expected to continue.

But glycol makers are still trying to ease away from labeling their products as "permanent"—although that was the key to glycol's initial success. Now, producers and retailers

U.S. Ethylene Glycol Use-Pattern in '58

(million pounds, estimated)

Antifreeze	880
Exports	75
Cellophane	45
Polyester fibers	35
Explosives	30
Polyester alkyd, gum resins	20
Electrolytic condensers	5
Miscellaneous, includes inventories	85

plug "full-season protection" rather than reuse of the antifreeze. Other sales techniques include retailers' "bring-your-own-container" deals and all-season checkup plans.

Prevailing optimism about future demand is, of course, largely pinned to the steadily increasing number of passenger car registrations.

Cellophane and Fibers: Use of ethylene glycol this year as a softener in cellophane production will be an estimated 45 million lbs.; that represents a 4% slice of total U.S. glycol demand. Requirements for this purpose should increase steadily, since cellophane film production—despite competition from other packaging films—will probably hit 555 million lbs. by '62, about 120 million lbs. more than is estimated for this year (*CW, June 21, p. 93*).

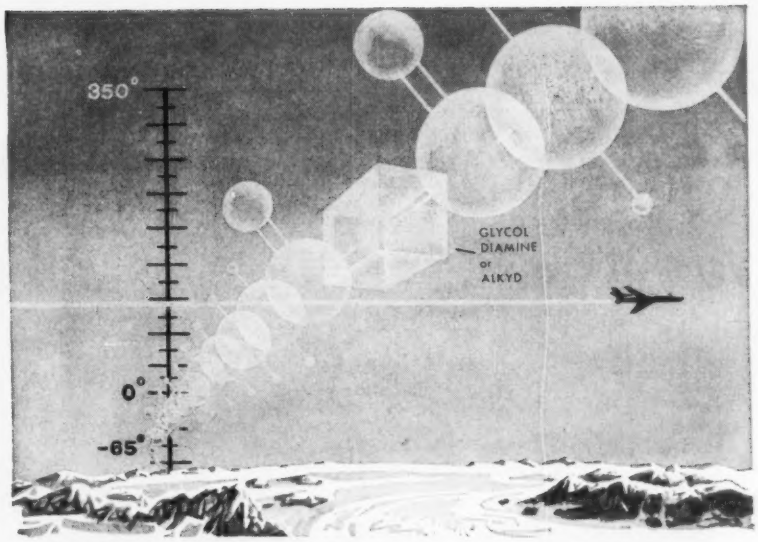
Use of ethylene glycol in polyester fiber production—considered by some as "the brightest spot in the over-all glycol potential growth picture"—may reach 35 million lbs. this year. And upcoming capacity should further boost demand:

- Du Pont's Old Hickory, Tenn., plant will go into operation in late '59, will ultimately more than double the company's Dacron polyester fiber capacity to 100 million lbs./year.
- Fiber Industries, Inc. (a joint venture by Celanese Corp. and ICI) will begin construction, probably early next year, of a 40-million-lbs./year polyester fiber (Teron) plant at Shelby, N.C.

Two other polyester fibers are stirring up considerable trade talk—Eastman Chemical's Kodel and Goodyear's Vitel—but glycol marketers say they still don't know whether their production will require ethylene glycol.

Explosives Slump: The '58 use of ethylene glycol in production of low-freezing-point dynamite is estimated at 30 million lbs., some 5 million lbs. less than was used in '56. Moreover, this will continue to be a downhill market because of competitive impact of less costly fertilizer-grade ammonium nitrate (*see also p. 46*), which is rapidly taking over as top blasting agent in heavy construction, quarrying and strip mining (*CW, June 28, p. 67*).

There's a host of other uses, and they all contribute substantially to a glycol market picture that is becoming brighter each day.



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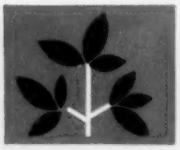
IF YOU MAKE  HERBICIDES

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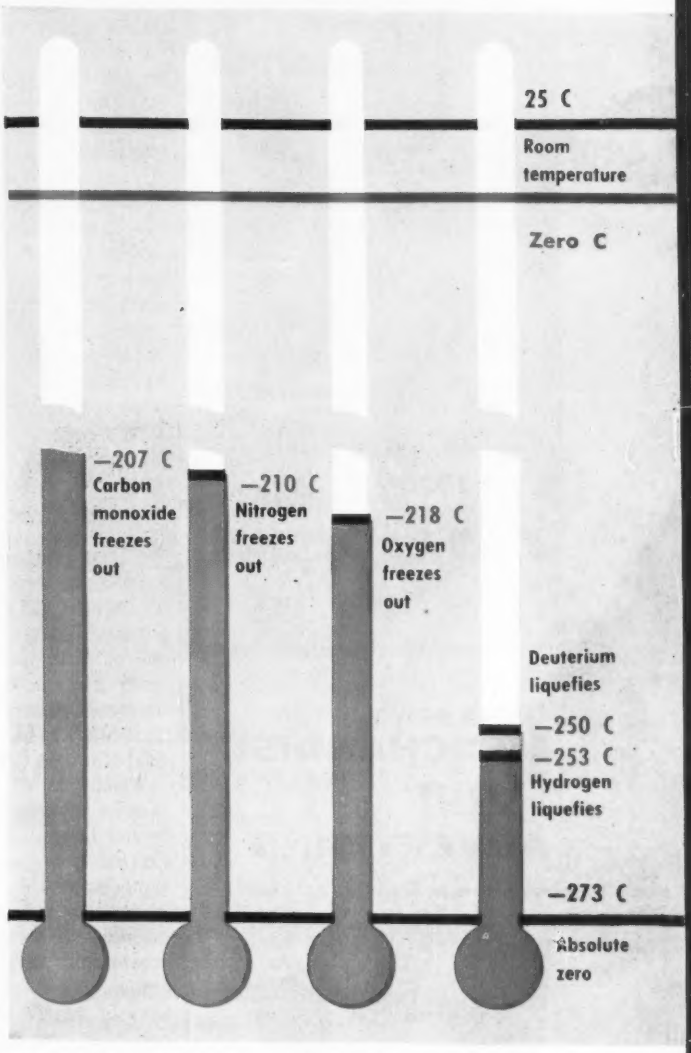
Big Freeze Boosts Heavy-Water Flow

L'Air Liquide Co. last week revealed that it is going onstream with a revamped version of its low-temperature heavy-hydrogen distillation plant at Toulouse, France. With the new installation, said to be adaptable to any size of plant, Air Liquide claims a clear head start in commercializing the ultracold separation technique.

Distillation of hydrogen to obtain deuterium has been slow to take a place as a major route to heavy water, but, as brought out at the recent Geneva Atoms for Peace Conference, the process is being earnestly employed by numerous companies. Main holdback has been lack of experience in large-scale operations at the frigid temperature of —253 C. But three of Air Liquide's plants are using the process—including two pilot plants, one of which dates back to '54. The firm believes that the wealth of operating experience it has gained has since proved the economy of the process.

But others are also trying the hydrogen distillation route, as well as a spate of other methods:

- About a year ago (*CW Technology Newsletter, Aug. 17, '57*), Farbwerke Hoechst started up a 6-tons/year heavy-water plant, using hydrogen distillation, which is now in intermittent operation.
- The Indian government reported at the Atoms for Peace Conference that it is using preliminary concentration of deuterium by electrolysis, followed by the hydrogen-distillation concentration.
- National Bureau of Standards (Boulder, Colo.) has preliminary operating data on hydrogen distillation in a lab-size unit, started up about a year ago.
- Arthur D. Little, Inc. (Cambridge, Mass.) reported at Geneva on studies it has been making on the hydrogen distillation route. ADL picked up the study of hydrogen feed purification and suitable insulation in '54, following the end of the design project of Hydrocarbon Research, Inc.
- Du Pont engineers reported at Geneva on recent costs of the Atomic Energy Commission's big (500-tons/year) hydrogen sulfide-water exchange plant at Savannah River, S.C. (*CW, Oct. 5, '57, p. 55*).
- Showa Denko, KK. (Tokyo), has a laboratory pilot plant for production of heavy water by combined electrolysis and hydrogen-steam exchange, plans a 9-tons/year plant.
- Researchers at University of Marburg (Germany) are also working on hydrogen-steam exchange, claim to have developed an effective liquid-phase catalyst (*CW Technology Newsletter, Jan. 11*).
- According to another Geneva report, a British firm, Constructors John Brown Ltd., has worked the wrinkles out of an economic ammonia-hydrogen



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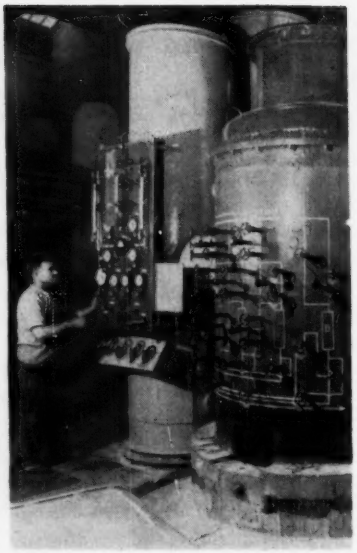
exchange process, which had also been in need of a suitable catalyst (*CW Technology Newsletter, Aug. 30*).

Experience Counts: In the field of hydrogen distillation, Air Liquide believes its experience gives it a decided edge over other advocates of the method. Some of the reports coming out of other research efforts cover material that Air Liquide has already studied and, in some cases, rejected, according to Frank Kerry, manager of the firm's U.S. branch, American Air Liquide Co. (New York).

The company got into heavy hydrogen distillation in '54 when the French counterpart of AEC sponsored its first pilot plant, one using electrolytically produced hydrogen as feed stock. Purpose of this unit was to investigate the actual problems of volume distillation at the extremely low temperatures involved. With a capacity of over 2 tons/year, the pilot was operated continuously until the distillation problems were overcome.

The following year, a small laboratory pilot plant was set up to study the final purification step of the hydrogen, which is produced from synthesis gas from a large ammonia plant. (Toulouse was chosen as the site of these operations because it already had one of the world's largest ammonia plants in the 550-tons/day facility of ONIA—the National Industrial Nitrogen Office.)

Finally, in '57, a multitons/year industrial experimental plant was built to give large-scale data of the production of heavy water from ammonia synthesis gas. Shut down for improvements this spring, it has undergone extensive mechanical redesign, is now considered ready for efficient operation. Air Liquide says that problems of heat exchange, analysis and operation have been overcome; it believes that it could now design and erect a plant to produce 40 tons/year, the maximum quantity of heavy water obtainable from the existing ONIA ammonia facilities. The cost estimates made by Hydrocarbon Research in '51—updated in '55 to $170/annual pound of capacity and $16/lb. operating cost—were pretty much borne out by Air Liquide's experience. And a point strongly in favor of the process: economically competitive units as small as 10 tons/year can be built, whereas the economics of some routes require much larger facilities.



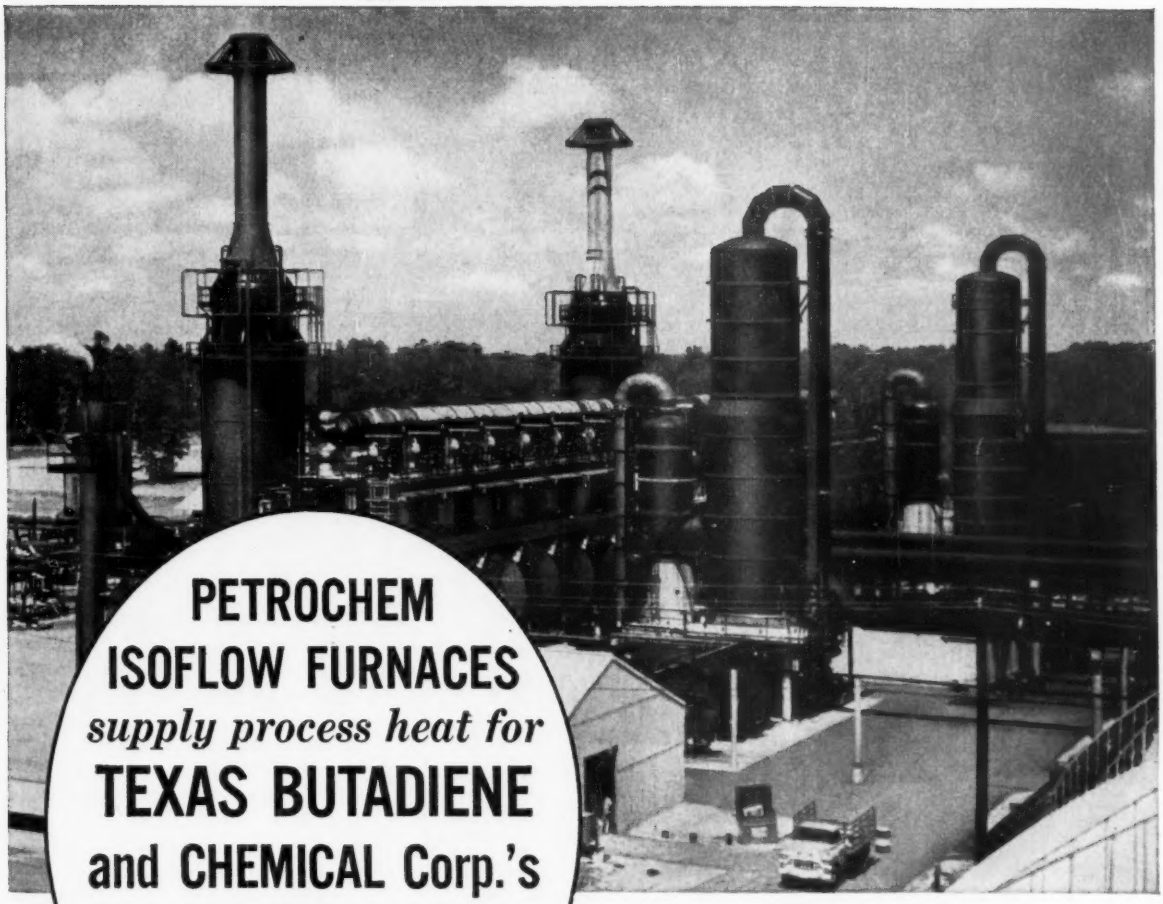
Air Liquide's pilot hydrogen distillation unit supplied purification data.

Plenty of Company: Of Air Liquide's hydrogen distillation competitors, most advanced is the Hoechst project, which is entirely privately financed. The Indian project will be tied in with a fertilizer plant, is planned to produce heavy water at a cost of just under $28/lb. (AEC's selling price), including 10-year depreciation of $2,750,000 construction costs (assuming power at 2.8 mills/kwh.).

The NBS studies are still quite small and fundamental. A recent report indicates that present studies are concentrating on improving the plate efficiencies of a 6-in. distillation column. Efficiencies in a 1.5-in. column ranged up to 70%, dropped to 45-55% in the larger column. NBS is now trying to find out why.

Other Routes: Still producing more heavy water than any other process is AEC's three-step route (hydrogen sulfide-water dual temperature exchange, distillation, electrolysis). The previously announced operating cost of $15/lb. has been cut to $13.50/-lb. The complete plant, including distillation and electrolytic concentrating facilities, was built in '51-'52 for $164 million, or $164/annual lb.

Showa Denko's work is being done for the Japanese atomic energy commission. In addition to the processes now in favor—combination of electrolysis and hydrogen-water exchange for heavy-water enrichment from 0.015 to 3%, distillation to 86% and



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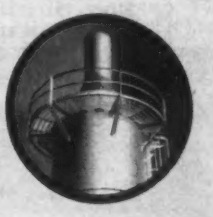

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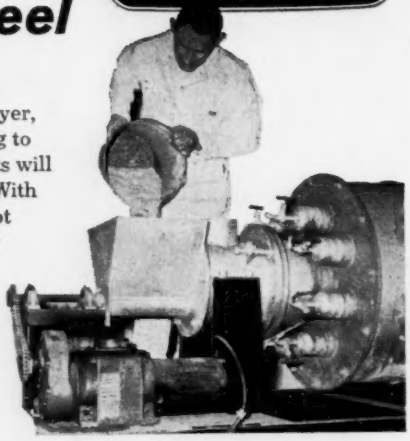

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electrolysis to 99.8%—dual temperature exchange and hydrogen distillation are also receiving active study in Japan.

Growing Demand: With the growing number of heavy-water-moderated power reactors, and the ever-nearing reality of deuterium-using fusion processes, heavy water is sure to have a growing market. And with individual sales by AEC already running 10 tons and more, it's easy to see that non-AEC capacity is hardly sufficient to meet the demand. With the solution of ultralow-temperature problems, hydrogen distillation stands a good chance of being the next process to be adapted to large-scale production.

'Red Hot' Insulation

Westinghouse Research Laboratories last week unveiled a new system of electrical insulation designed to stand up to rugged temperaturers and a new transducer said to solve many of the problems that have hindered ultrasonic utilization.

Based on heat-resistant phosphate binders, the new materials are completely inorganic—the first, says Westinghouse, to stand up under operating temperatures in the thousand-degree range without some form of artificial cooling.

To test its new insulating system, Westinghouse developed a "red hot" motor (it actually glows in the dark) that has run for more than 100 hours while sealed inside an oven at 950 F. And by placing the bearings outside the oven and cooling them with air, researchers have subjected the new insulation to continuous operation at 950 F for as long as 1,000 hours, intermittent operation for shorter periods at temperatures up to 1200 F.

The inorganic materials have been prepared experimentally in a number of forms suitable for a wide variety of uses. The four basic insulating components used in the hot motor:

- Phase insulation and slot insulation, both consisting of a flexible sheet material of glass cloth and large mica flakes bonded with phosphate.
- Wire insulation, made by covering the wire with glass fiber and then impregnating it with a suspension of powdered mica in a phosphate solution. Finished wire is flexible, may be wound conventionally.
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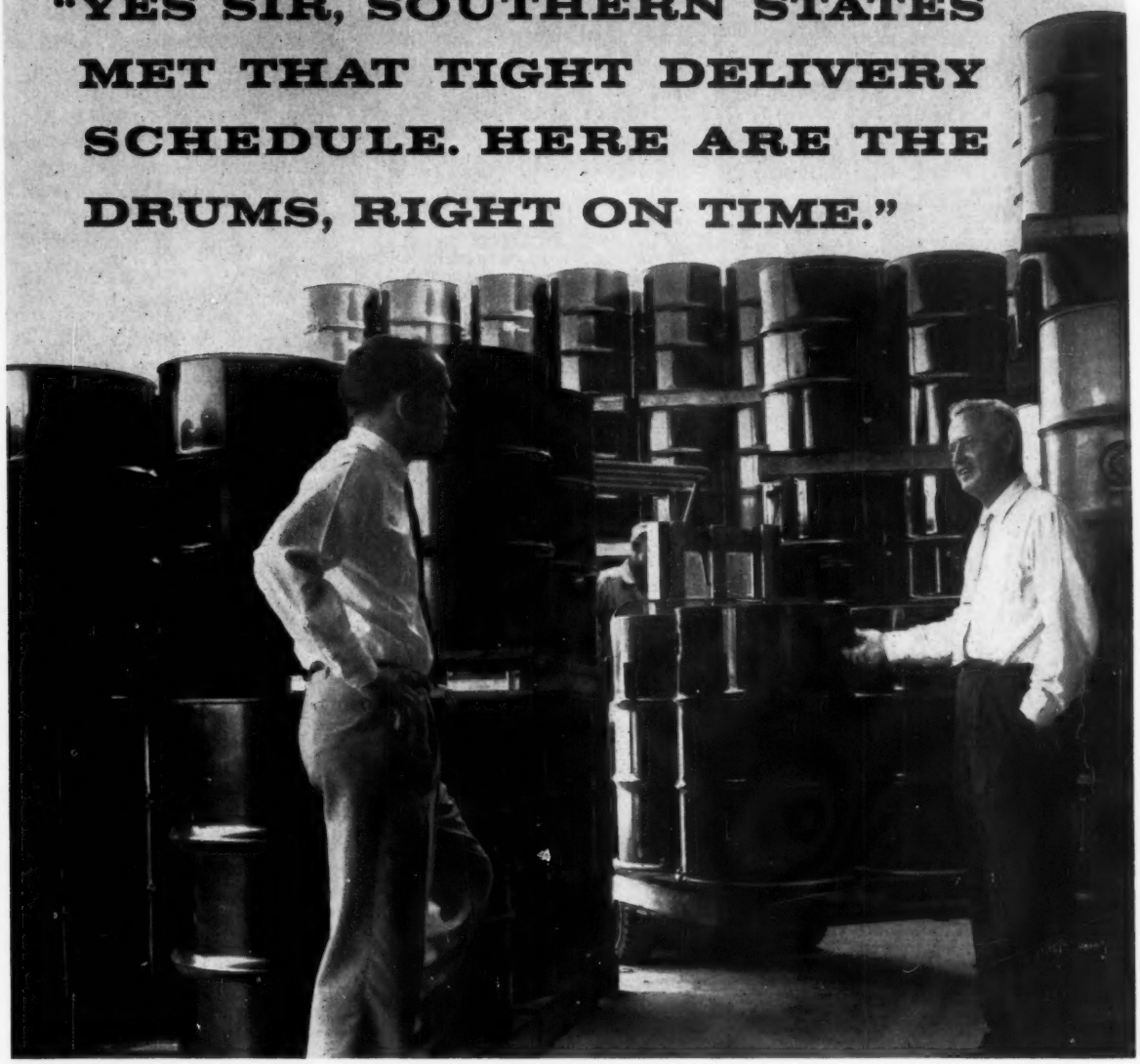

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ENGINEERING

pound, consisting of a liquid slurry of phosphate solution containing Wollastonite, silica and other chemically reactive materials. After winding and impregnation, the potted motor is dried to remove free moisture, then pyrolized above 600 F to develop the best properties of the insulation.

The new transducer — magnetostrictive type — makes use of a new design, described by Westinghouse as spaced lamination. It transmits the ultrasonic vibrations to a liquid. But, compared with conventional transducers, says Westinghouse, it gives twice the usable power from the same electrical input. The added power is equally distributed over the entire plate. The new device is one big reason why Westinghouse foresees nonmilitary sales of ultrasonic equipment soaring from the present $40 million to $150 million—within the next five years.

PROCESSES

New Catalysts: Two new catalysts are being offered for problem hydrogenation applications:

• A new selective hydrogenation catalyst in production at Louisville is Catalysts and Chemicals Inc.'s C36—a nickel-cobalt-chromium material on alumina. C36, designed for hydrogenation of acetylene in raw, sulfur-bearing streams of olefins (e.g., ethylene, propylene), has demonstrated high activity and selectivity, is now being installed in three major ethylene plants. Additional advantage: it is said to permit high plant capacities without the need for frequent catalyst regeneration to remove deposited polymeric materials.

• A new catalyst for selective hydrogenation of carbon-to-carbon double bonds of hard-to-hydrogenate inedible oils has been developed by Chemical Products Division of Chemetron Corp., will be manufactured at the company's Girdler Catalysts plant (Louisville, Ky.). Dubbed G-53, the new material is described as a dry-reduced, oil-suspended catalyst consisting of nickel (25%), kieselguhr support (9%) and hardened vegetable oil or tallow suspending oil (64%). Lab studies and plant-scale tests, says Girdler, indicate that effective service life of G-53 is 50-100% longer than that of other catalysts of this type.

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Sales Branch Supervisor—Career Opening—St. Louis Branch Office—Small, aggressive, well-established national company. Chemicals and pharmaceuticals. Applicant must be able to organize and manage field sales engineers (10) and handle executive sales. Technical background required. Write giving complete personal data. P-9071, Chemical Week.

Chief Chemist and Chemists—Paper Chemicals Department of fast growing Southeastern Chemical Manufacturer wants top notch man to head new laboratories. Also wants Research and Development Chemists. P-9077, Chemical Week.

POSITION WANTED

Electro-Plating Engineer. Graduate chemist, age 44; 22 years diversified experience, extensive background in all phases of metal finishing surface treatments and corrosion problems. Equipment design process control research and development. Seeks responsible position Metropolitan New York City area. PW-9062, Chemical Week.

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FS-9027 Chemical Week
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Stokes 5' x 8' Rotating Vacuum Dryer (Dryer-blender), stainless steel internal for vacuum, steel jkt. 45 PSI. Perry, 1415 N. 6th, Phila., Pa.

POSITION WANTED

M.S. Ch. E., age 26, 3 years experience poly-ethylene compounding, desires sales technical service or development position. Northern location preferred. PW-9106, Chemical Week.

SELLING OPPORTUNITY WANTED

Mfgr's rep. in New England area desires indus-trial chemicals, paper chemicals, or process equipment. RA-8899, Chemical Week.

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P-9150 Chemical Week
Class Adv. Div., P. O. Box 12, N. Y. 36, N. Y.

CHEMICAL WEEK

CHARTING BUSINESS

NOVEMBER 1, 1958

Nylon Inflates Replacement Tire Sales

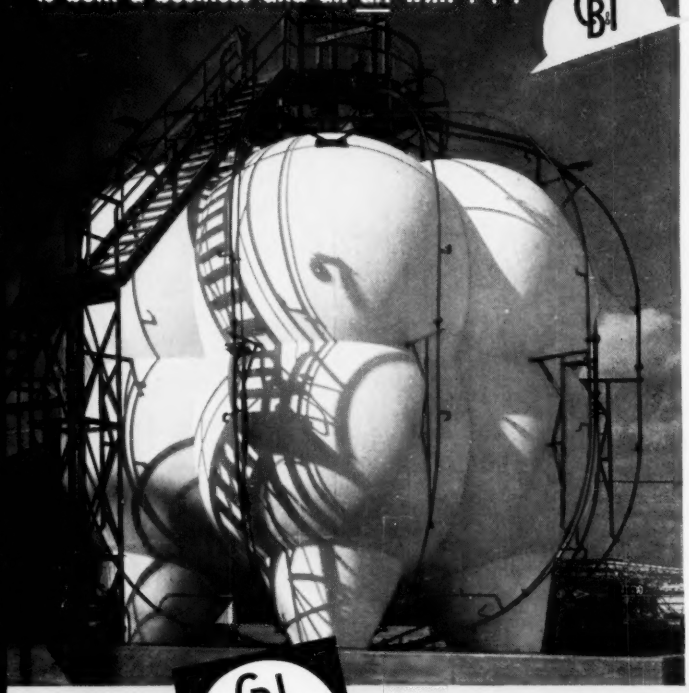
For the seventh consecutive year, sales of replacement tires will gain. Industry estimates that some 59 million will be sold by the end of '58, nearly double '51's sales of 34.2 million tires.

This optimistic estimate is in sharp contrast with early prognostications that replacement tire sales would follow the '58 downward trend of original-equipment tire sales.

Slump in auto production has cut deeply into sales of original-equipment tires. Auto output will be 4.3 million cars this year, far below the 6.1 million mark of '57. Auto makers will buy only about 25 million tires this year, 31% drop from last year's purchase of 32.7 million.

Accelerating the replacement-tire demand has been the greater acceptance of nylon tire cord. The tire trade estimates that six out of 10 replacement tires sold this year will be made with nylon cord. In the total tire market, nylon tire cord now is used in about 25%, rayon in almost all the rest.

The containment of modern fuels and materials is both a business and an art with . . .



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A few typical installations are shown and described below. Of particular interest, is HORTON-CLAD®—a new vacuum bonding process which makes it possible for CB&I to produce composite plates in a larger range of combinations than has previously been available. Write our nearest CB&I office for the new bulletin on *Hortonclad* and literature on *CB&I Special plate structures.*

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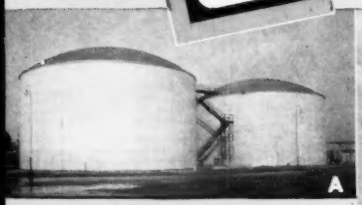

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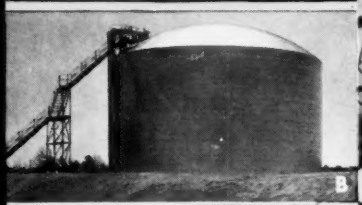

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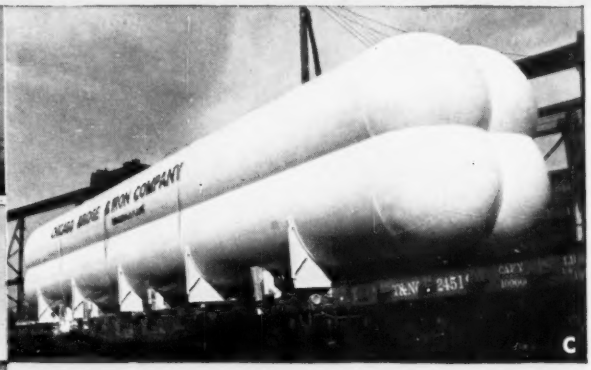

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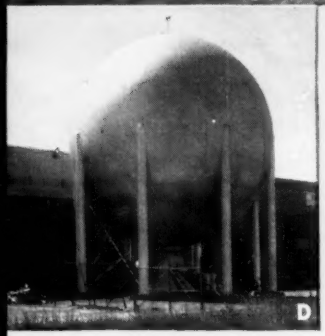

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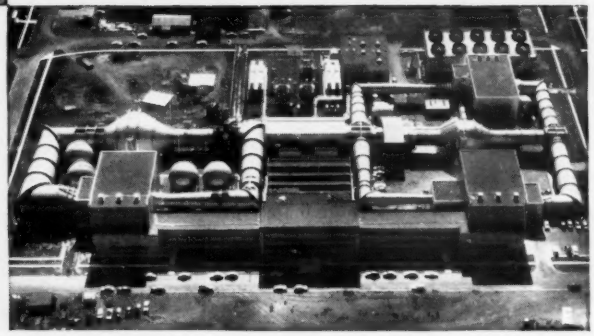

E

TOP, LEFT—14-lobe MULTISPHERE designed, fabricated and erected by CB&I to store 100,000 gallons of liquid methyl chloride at 150 lbs. working pressure. Design offers optimum versatility for pressure vessels.

A—5052 ALUMINUM was used for these ammonium nitrate storage tanks.

B—LIQUID PROPANE is stored by refrigeration at 1½ lbs. working pressure at minus 44° F in this unique 70-ft. diameter tank, designed and built by CB&I.

C—MULTICYLINDER Multi-lobe pressure vessels such as this offer advantage of high pressure storage where space is limited. Vessel is designed for 250 lbs. working pressure.

D—VACUUM SERVICE is provided by Hortonsphere® at a University of Toronto wind tunnel installation.

E—TUNNEL SECTIONS for wind tunnel were fabricated and erected by CB&I. A supersonic wind tunnel for Convair Division of General Dynamics was recently completed by CB&I as a "turnkey" project.

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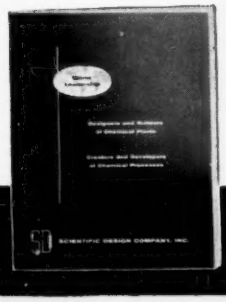

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